The New England
Journal of Medicine

Copyright, 1952, by the Massachusetts Medical Society

Volume 246 MAY 22, 1952 Number 21

ANNUAL ORATION

THE NEW ENGLAND JOURNAL OF MEDICINE AND THE MASSACHUSETTS MEDICAL SOCIETY*

JOSEPH GARLAND, M.D.†

BOSTON

MR. PRESIDENT, fellow members of the Massachusetts Medical Society, ladies and gentlemen: In accepting the honor of becoming on this day your one hundred and forty-third orator out of a possible one hundred and forty-nine since the first of these verbal marathons was run, I am humbly conscious of the fact that I am appearing before you in substitution for my friend, John Fallon. Had he survived the year since last we met, he would have been standing at the rostrum and I would have been sitting at his feet.

There is, however, some precedent for even the editor's becoming also the orator. In 1818, fourteen years after this series of addresses had been inaugurated, James Jackson, associated with John Collins Warren in establishing the *New England Journal of Medicine and Surgery*, delivered the annual discourse, "On Fever." Two years later, Warren himself addressed our ancestral prototypes "On the Sensorial and Nervous System in Man and Animals," and in 1822 John G. Coffin, who was to assume the editorship of the Boston *Medical Intelligencer* in 1827, delivered "A Dissertation on Medical Education and on the Medical Profession."

And so the list continues. In 1833 Walter Channing and in 1847 John Ware; in 1875 and again in 1881 J. Collins Warren, and in 1892 Frank W. Draper, all at one time or another editors of the *Boston Medical and Surgical Journal*, have occupied this somewhat exalted position at the annual meetings of our Society. Great names they were in Massachusetts medicine in their day, and we are proud that they are of our family, with their discourses, pressed and preserved like autumn leaves, in those massive volumes comprising the *Communications of the Massachusetts Medical Society*.

When, in 1812, the *New England Journal of Medicine and Surgery and the Collateral Branches of Science* was established, as an independent quarterly publication, the Massachusetts Medical Society, today the oldest state medical society in the country in continuous existence, was already in its thirty-first year. A Faculty of Medicine had been created by the Harvard Corporation less than thirty years previously, the American Revolution had taken its place in history within a generation and the second war with the mother country was about to begin. The Massachusetts General Hospital had been chartered in the previous year and was soon to be built according to the specifications of its trustees "of stone and of that kind called granite." As a result of the generosity of the Great and General Court of Massachusetts, this material was "hammered and fitted for use" by the convicts at Charlestown, the cornerstone being laid on July 4, 1818.

Thus, in the decade preceding the one that saw the birth of Pasteur and of Lister, of Florence Nightingale and of Clara Barton, — all pioneers in the cause of humanity, — a freer exchange of ideas among physicians was taking place, and the beginnings of modern medicine were stirring in New England.

The *New England Journal of Medicine and Surgery* was the direct ancestor in an unbroken line of our own *New England Journal of Medicine* and, so far as I know, had but one journalistic predecessor that has continued in uninterrupted publication since its establishment.

This is the monthly *Edinburgh Medical and Surgical Journal*, founded in 1805 and published since 1861 by the house of Oliver and Boyd. The firm had been established in 1778, quite unconscious, probably, of the revolt of certain far-off colonies across the water proceeding according to its ordained course. Oliver and Boyd still maintain their original quarters in Edinburgh's old town, in Tweeddale Court, off High Street, in a building probably of that stone called granite, already mellow with age when first they occupied it.

The third in the triumvirate of hardy perennial medical journals is the weekly London *Lancet*, first published in 1823 under the editorship of the turbulent Thomas Wakley. The *Lancet* began to diffuse its light in the same year as did the Boston *Medical*

*Presented at the annual meeting of the Massachusetts Medical Society, Boston, May 20, 1952.

†Editor, *New England Journal of Medicine*.

Intelligencer, also a weekly and a pioneer forebear of our own periodical.

The first publication for which our Society itself was responsible, although in no ordinary sense a journal, was that of *Medical Papers Communicated to the Massachusetts Medical Society*, the first part of Volume I of which appeared in 1790. The leading article in this early venture of the youthful organization was "An Account of the Weather and of the Epidemics, at Salem, in the County of Essex, for the Year 1786." It had been presented before the Society by Edward Augustus Holyoke, of Salem, our first president and destined to become the patriarch of patriarchs of New England medicine, for he remained active in good works nearly to the time of his final summons, at the age of "one hundred years and eight months, lacking one day." The balance of Volume 1, the second of these literary mausoleums, published nineteen years later, contains the well preserved remains of the first of our annual discourses, delivered in 1804 by Isaac Rand, on "Phthisis Pulmonalis."

Our Society, it appears, even in those rugged days had leanings toward the publication of a journal of its own, for it was voted in February, 1812, "That the committee of publication be directed to ascertain if possible who are the conductors of a publication entitled the '*New England Journal of Medicine and Surgery*,' with a view to determine the expediency of incorporating the Communications of the Society in the said publication."

As Burrage points out in his history of the Society, "We are justified in assuming that the committee found out who were the conductors of the *New England Journal of Medicine and Surgery*, for John Gorham, one of the committee of publication, was a founder of that journal and for fifteen years an editor." Nothing seems to have come of this tentative exploration.

Two years after its inception the editors of the journal promised its readers that it would "continue to be a vehicle of original communications, and of the correspondence of such practitioners and experimental observers, as may favour the conduction of the work with interesting facts, inferences and improvements, relative to medicine and to general science." They did more than this; they expressed the wish to add one or more plates to each volume, a design that they proposed to "carry into effect so far as the state of the subscriptions will justify the expense."

Some of the titles bear out the journal's claim to represent also the collateral branches of science, for such subjects are included as the "History of the Forest Trees of North America," a scholarly exercise translated from the French; "Description of a Bank for Alpine Plants" and "Remarks on the Importance of Inland Navigation from Boston, by the Middlesex Canal and Merrimack River." Jacob Bigelow, lecturer on materia medica and botany in Harvard University, contributed "Some Account of the White Mountains of New Hampshire," and soon, not to be outdone, George Hayward gratified the curiosity of the journal's readers with a "Description of An Elk."

The weekly *Medical Intelligencer* set also a good table. Printed in three-column newspaper form, it contained, in its own words, "Extracts from Foreign and American Journals; a Variety of Local Intelligence on Subjects Connected with Medicine; Biographical Sketches of Distinguished Surgeons and Physicians; Descriptions of the Principal Hospitals in Europe; Original Articles on Various Diseases, with Concise Views of the Improvements and Discoveries in the Medico-Chirurgical Sciences."

Its introductory message to the profession announces its editor's fond aspirations as follows:

> In the United States, where Science is described as the palladium of national prosperity, every attempt to diffuse truth meets with a cordial reception. No study is more rapidly gaining the dignity it so obviously merits than medicine. A few years ago it was not uncommon for people to be born bone-setters, whose chirurgical celebrity was as immediate as their methods of operation were infallible. Cancer Doctors devoured the humble victims of their duplicity with a slow but certain torture; and a seventh son, however mean, was a favourite of fortune and the peculiar gift of Providence. These scenes of ignorance are passing away. Reason, the best weapon against the absurdities that have enslaved the mind, has triumphed over bigotry and superstition.

Would that these sentiments could be repeated today with equal assurance!

In 1828, the owners of the *New England Journal of Medicine and Surgery* purchased the *Intelligencer* for the sum of $600 and combined the two publications into the weekly *Boston Medical and Surgical Journal*, of little less than sainted memory. The progress of medicine now quickened its pace — at least in Massachusetts.

In the first volume, as a matter of scientific interest, a case of comminuted fracture of the skull in a youth of seventeen tender years was described, in which several pieces of bone were removed from the brain. Five years later the mother reported that the patient, who had always been stupid and never free from headache, had lost his headache and had become "as sharp as a briar."

"It would seem from this case," according to the conclusion, "that a redundancy of brain is equally unfavorable to the development of mental manifestations as a lack of it."

Somewhat later, when J. V. C. Smith, the originator of the *Intelligencer*, had commenced his more than twenty years of editorship of the *Boston Medical and Surgical Journal*, a note is found concerning an alcoholic picked up in the streets of London, the liquid in whose ventricles "appeared, to the senses of the examining students, as strong as one-third gin and two-thirds water." Not a scientific observation, perhaps, but picturesque.

Some indication of the *Journal's* value to the medical community is the very fact that even in

weekly publication it survived and must even at times have prospered, for upwards of a hundred years. Under the ownership of succeeding groups of "medical gentlemen," it conformed, according to the editors of 1868, in which year it adopted a two-column format, "somewhat in shape and appearance to the best modern specimens of hebdomadal literature." Nor was it without competition in its own locality, for during its century of existence under the old familiar name the *Boston Medical and Surgical Journal* saw close to 80 other journals of medicine come into being in New England and saw most of them, like the more or less abundant snows of yesteryear, depart.

Meanwhile, the *Communications of the Massachusetts Medical Society* had continued to appear in huge volumes, each containing the transactions of several years, including the annual orations, or discourses, as they were then more happily designated.

Noteworthy among them was that epochal classic, delivered in 1835 by Jacob Bigelow, on "Self-Limited Diseases," characterized by Oliver Wendell Holmes as having "more influence on medical practice in America than any other similar brief treatise." Its lesson is summarized in the single sentence: "It is a common error to infer that things which are consecutive in the order of time, have necessarily the relation of cause and effect." Thus the age-old fallacy of *post hoc ergo propter hoc* was exposed as such once more.

The field of medicine was broadening, the consciousness of the obligations that society owes to its members was deepening, and unexpected agencies were sometimes found to carry out the commands that compassion put upon them.

In 1841, Dorothea Dix, having retired to her Beacon Hili house at the age of thirty-nine after a physical breakdown occasioned by an excessive application to the problems of pedagogy, discovered the conditions under which the insane of the Commonwealth were confined in many of its institutions — "wretched in our prisons and more wretched in our Alms-Houses." Her breakdown was canceled, and she began the career that was to occupy the next forty years of her life with an investigation and a report to the General Court of Massachusetts that may be found in the *Boston Medical and Surgical Journal* of March 1, 1843.

> I proceed, Gentlemen, briefly to call your attention to the state of Insane Persons confined within this Commonwealth, in cages, closets, stalls, pens: Chained, naked, beaten with rods, and lashed into obedience!

The words sank into the minds of our legislators and opened their hearts, the immediate result being an enlargement of the state hospital at Worcester. Miss Dix's second adventure was the procurement of funds with which to build the Butler Hospital in Providence. The Trenton State Hospital in New Jersey was the fruit of her labors; she visited every state in the union east of the Rocky Mountains and was instrumental in the establishment of 30 hospitals before she turned her attention to Great Britain and secured the appointment by Queen Victoria of a Royal Commission to study the deplorable conditions under which the insane then existed in Scotland!

Three years later, two papers appeared in the *Boston Medical and Surgical Journal* that have made Volume 35 of the publication a collector's item. The first of these, published on November 18, 1846, is "Insensibility During Surgical Operations Produced by Inhalation," by Henry J. Bigelow. The second, which appeared on December 9, was by John C. Warren himself on "Inhalation of Ethereal Vapor for the Prevention of Pain in Surgical Operations." His final statement is a masterpiece of scientific reserve:

> Let me conclude by congratulating my professional brethren on the acquisition of a mode of mitigating human suffering, which may become a valuable agent in the hands of careful and well-instructed practitioners, even if it should not prove of such general application as the imagination of sanguine persons would lead them to anticipate.

Such was the part that the *Boston Medical and Surgical Journal* played in introducing ether to the universe!

In February, 1847, the matter of publishing a medical journal of its own came up again in the Council of the Society, on the motion of no less a person than its president, Jacob Bigelow. The motion was referred to the Committee on Publications, which brought in a resolution authorizing itself to issue a quarterly publication to be called *The Journal of Practical Medicine of the Massachusetts Medical Society*.

The report was accepted in May, but at the fall meeting of the Council a new motion was introduced, calling for the postponement of publication for one year because of the condition of the treasury. An amendment struck out the words "for one year," and before favorable action was finally obtained the one year was multiplied by seventy-three.

Five years later, with that versatility to which we have been long accustomed, the *Journal* published an account of a "Strangulated Phrenic Hernia in A Horse."

Time marches on, and the art and the science of medicine march with it. The annual discourse of May 30, 1860, "Currents and Counter Currents in Medical Science," by Oliver Wendell Holmes, is one of that writer's most felicitous medical essays. I wonder how many physicians below the age of fifty have read it. Here, again, the privilege of publication went perforce to the Society's *Communications*.

Upholding the effectiveness of nature in the treatment of disease, Dr. Holmes noted that on nature's side "we have had, first of all, that remarkable discourse on Self-Limited Diseases, which has given the key-note to the prevailing medical tendency of

this neighborhood, at least, for the quarter of a century since it was delivered."

> Not to make silver shrines for our old divinities [he concluded], even though by this craft we should have our wealth, was this Society organized and carried on by the good men and true who went before us. Not for this, but to melt the gold out of the past, though its dross should fly in dust to all the winds of heaven, to save all our old treasures of knowledge and mine deeply for new, to cultivate that mutual respect of which outward courtesy is the sign, to work together, to feel together, to take counsel together, and to stand together for the truth, now, always, here, everywhere; for this our fathers instituted and we accept, the offices and duties of this time-honored Society.

As further evidence that the interests of the private practitioner were the main goal of this erudition of a bygone century, let me quote from an issue of the *Journal* of a hundred years ago, or nearly so. The excerpt is entitled "A Card Left on a Doctor's Door, On His Going Out to Tea."

> Here dwells, awaiting all the haps of life,
> A doctor humble and of less conceit;
> For lofty station never was his strife,
> And mammon-folly mars not his retreat.
> Few are his wishes, with the world content;
> His daily recompense enough, though small;
> In early studies all he had he spent;
> Now gains in practice oft ('twas all he hoped) a call.
> No farther seek him till tomorrow's dawn,
> Let him, uncalled, a casual feast attend
> (Where he awhile from troubling care has gone),
> The supper of a neighbor and a friend.

In 1873 "A Case of Extra-Uterine Foetation" was published in the *Journal;* my grandfather had come up from Gloucester to report it before the Obstetrical Society of Boston.

A sporadic flirtation between Society and *Journal*, though fruitless, continued. In 1880, when F. W. Draper, the treasurer, sent out a circular letter asking if the *Boston Medical and Surgical Journal* should be substituted for Braithwaite's annual *Retrospect of the Medical Literature and Science*, which was then being distributed to the fellows of the Society, the answer came back "Nay," and again in 1898 when the Worcester North District Society introduced a motion in Council to the same general effect, economy triumphed and the fellows were again denied this richly cultural opportunity. The cost of the *Journal* was at that time five dollars a year; in the succeeding fifty-four years three dollars have been added to the rate for independent subscribers, and five dollars are now being deducted for its support from the dues of the fellows, $6.54 per subscription being the net cost of its distribution!

Fresh ferments were at work. In 1886 a report of Reginald H. Fitz's paper on "Perforating Inflammation of the Vermiform Appendix, with Special Reference to Its Early Diagnosis and Treatment," read before the Association of American Physicians, was published, and three years later, "Acute Pancreatitis" appeared, by the same hand. The medical practice of our grandfathers was passing over into the practice of our fathers, and that which we ourselves, perhaps in sinful pride, have designated as the Golden Age of Medicine was about to move in on mankind with this new and fateful century.

In 1914 the affair between the Massachusetts Medical Society and "the conductors of a publication entitled the 'New England Journal of Medicine and Surgery' "and their successors came to an honorable conclusion. In that year the *Boston Medical and Surgical Journal* became the official organ of the Society, assuming the publication of its proceedings. The final stage in the union was consummated in 1921, with the purchase of the venerable publication by the Society for the sum of a dollar — which, I have been told, was never paid. Thus our journal achieved the relative security of sponsorship, which has permitted so many medical periodicals to continue in existence in a highly competitive world, and the Society acquired a publication of considerable distinction at something better than a bargain price.

In the conduct of the *Journal* during these historic years, George B. Shattuck had stood out as its giant among editors. Ink must have flowed through his veins as well as blood, for he had assumed its editorship in 1881 and had held it on its course until 1912, when he was succeeded by E. W. Taylor and then Robert M. Green, who carried on until the year of the purchase. At that time the Committee on Publications drafted Walter P. Bowers for the post, which he held with unique distinction until 1936, when he was succeeded by Robert N. Nye. The present executive editor, Clara D. Davies, ably guiding the footsteps of four successive editors, alone has bridged the years between the *Journal's* days of solitary independence and the present.

These thirty years have been crowded with events of which a few only are germane to the account. In 1923, the result, I am sure, of mutual Yankee sagacity on the part of both the publishers of the *Journal* and the directors of the destiny of the Massachusetts General Hospital, the weekly Case Records of that institution were gathered into the pages of the *Journal*, where they have resided ever since. Despite occasional differences of opinion on minor matters, no unconquerable feeling of frustration has been experienced by either party.

The final significant date in this presentation of a historical background is that of February 23, 1928. On that day the *Journal*, having borne for a hundred years practically to the moment the title that had inescapably linked it to the Boston scene, acknowledged its cosmopolitan ancestry and its own secret longings for a life unconfined by city limits, and again took title to all New England as its field. What the rest of New England thought of this geographical assumption remains another matter, except that the New Hampshire Society was thereafter willing to accept the *Journal* as its official publication.

In the succeeding years, probably because of its life of symbiotic felicity, the *Journal* seems to have found an increased sphere of usefulness. Its circulation, restricted at the beginning of its association with the Society to little more than the membership, has benefited so from the transfusion it received as to have taken on various collateral aspects. The addition of the Case Records opened new channels, and, particularly during and after the war, the number of independent subscribers in all parts of the world increased until now there are more than three times as many of them as there are of us. Much of this expansion was due to the astuteness of the late editor, Dr. Nye. The medical students of the country seem also to have found the *Journal* of some value, for of its nearly 20,000 independent subscribers approximately 5000 are in this category.

The association of the *Journal* with the Society represented not a break with the past but a link with the future — some assurance of support when times were hard, a guaranteed state-wide circulation and new functions to perform. It came at an opportune time. Competition was growing keener, with the world's supply of periodical medical literature emanating from over 5000 journals, including an increasing number of state-society publications, and with specialty journals *ad infinitum* descending like locusts on the land, seeking to devour the few spare dollars that might still be found in the wallets of our thriftier colleagues.

The character of the literature has changed with the needs of its readers, sensitive to the progress that has been taking place about them. The selection of material has required ever greater care in order that the majority of tastes might be at least partly satisfied. Few subscribers, presumably, read everything in their journals — nor do they read the entire Sunday paper; the many read according to their needs and interests — including the advertisements, the advertisers hope — and the few read not at all, possibly because of specific reading disabilities; perhaps, as the British practitioner confessed, because they find unopened medical journals in their wrappers handy missiles to hurl at the cat.

In the early days when communication was slow and the opportunities of obtaining reading matter were limited, information culled from various sources was eagerly received. The scissors and the paste pot were as powerful as the pen and much more easily employed; any journal's motto, like that of the humorous weekly of a generation ago, might have been "*aut* scissors *aut nullus*." Miscellany, intelligence, book notes and news made up a good part of a periodical's content. Original articles, although relatively few, were often of considerable merit, sometimes representing extremely accurate observations of cases.

Although no great amount of original research was produced during those years before the advent of modern medicine, the spirit of inquiry has nevertheless prevailed since Paracelsus burned the works of Galen in the novel belief that medicine had better make a fresh start. Nor can we forget two English practitioners, late in the eighteenth century, who left to us, their legatees, the foxglove and the lymph of cowpox — or the Reverend Stephen Hales, who in the same century measured the blood pressure and the rate of blood flow in horses.

Editors began tentatively to introduce their official views in the *Journal* in the 1840's and, after a considerable period of thus testing the bog to see if it would bear weight, came forth with an overt and acknowledged editorial section in the '60's. From that time on, an editorial point of view, when properly expressed, with regard to the truth as it is given to see the truth, with respect for an opposing opinion, — which may turn out to be the right one, then or at some future time, — without meanness or bitterness, has come to be considered by our editors as a legitimate and valuable adjunct to medical journalism.

Nor need the editorial necessarily be confined to topics related to medicine, so long as they are ones in which the reader has or might have an interest. As has been written elsewhere, certain proprieties consonant with the ethics of the profession must be preserved. "The duties of the physician as a citizen and the relations that should exist between him and the rest of society may be stressed, but a medical journal, although it may uphold a principle, cannot become the mouthpiece of any candidate or any party," nor should it otherwise, as Holmes warned his students a hundred years ago, "dabble in the muddy stream of politics."

As the forms of medical practice became more technical and more diversified and its followers more sophisticated, different technics became necessary to transmit the messages that marked its progress, to maintain reader interest and to meet the pressure of competition. Visual technics in particular came into prominence. The editorial promise of 1812 to publish at least one plate per volume if funds permitted had undergone considerable expansion by 1868, when actual photographic contact prints were pasted into the Society's transactions to illustrate a paper on orthopedic surgery by Buckminster Brown.

Still the pursuit of the eternal verities, though hot, has not ended. The mathematics of research has expressed itself in a multiplicity of graphs, charts and tables with the aid of which the average reader at a quick glance can often learn next to nothing — unless he has somehow mastered the elementary use of that unpredictable instrument, statistics. The amazing formulas of chemistry and physics have become part of our literature; photomicrographs and x-ray reproductions display their visual but still baffling technics in an all-out effort to bring the precision of science to aid in shoring up our ignorance, and the electrocardiograph still

sometimes fails to make the message of a humble and a contrite heart completely understandable.

As for medical art, that has indeed become a uniquely specialized profession, although not a new one, as one realizes after a glance at the drawings by Calcar in Vesalius's great book on the structure of the human body, published in 1543. The limits are set by the costs, and only the trade journals can demonstrate the real possibilities of medical illustration.

Outside of journalism are the even more spectacular though evanescent technics of moving pictures and television, which, when they are gone, leave but a vacant screen. For those products of the human mind that are worth preservation there is still the ancient sacrifice — that of reducing to a hard core of literate verbal construction those ideas that are considered sufficiently acceptable to become part of the record.

Writing, if not a lost art, seems at times to be a losing one. If editors have any function (and I would not disagree entirely with those who doubt it) it is that of trying to persuade authors that there is no good writing, only good rewriting, — that what is worth setting down at all can be done twice as well in half the number of words — only it takes twice as long to do it. Original writing, like tapping a maple tree, is tedious business, but the really slow work, and the hard sugar, come in the boiling down of the sap.

The graphic arts are indeed seductive, but any serious attempt to supplant by any means an original idea that has been firmly phrased and clearly printed would be an attempt to push back the keeping of the records of mankind to those dim periods prior to the Code of Hammurabi or the Ten Commandments.

In our search for the fundamental truths of life we know that we will find no easy road to discovery or to the recording and the transmittal of ideas. Progress in scientific endeavor, as in human relations, comes the hard way, and we are too often blinded by the illusions that beset us.

Each of us, in his search, is somewhat like the youth in Emerson's *Conduct of Life*, after he had entered the hall of the firmament, where all is system and gradation and every god is sitting in his sphere.

> On the instant, and incessantly, fall snowstorms of illusions. He fancies himself in a vast crowd which sways this way and that, and whose movement and doings he must obey; he fancies himself poor, orphaned, insignificant. The mad crowd drives hither and thither, now furiously commanding this thing to be done, now that. What is he that he should resist this will, and think or act for himself? Every moment new changes, and new showers of deceptions, to baffle and distract him. And when, by-and-by, for an instant, the air clears and the cloud lifts a little, there are the gods still sitting around him on their thrones, — they alone with him alone.

It is a principle often and piously enunciated that we must all, whether specialists or general practitioners, administrators or servants of the public in matters of public health, be dedicated to a single purpose — that of making continuously and universally applicable this knowledge of health and disease that has increased so greatly. For the intricacies and the costs of medical care long ago reached the point where the utmost organization of our facilities is necessary even to approximate its proper distribution. This is the new direction in which research must turn, to teach us how to direct our skills into the channels where they are most needed. It is in this sincere attempt to ensure the fullest deployment of medical care, with due consideration for the physician, that the present problems lie — in promoting the health of the community and the individual.

In the discharge of this function, our own Society's most valuable contributions are in postgraduate education, including the support of one of the world's great medical libraries; in the promotion of cordial public relations, and in the encouragement of a high grade of professional service, without which our vaunted ethics are as nothing. And implicit in all these matters is the good will of each individual member of the profession, loving his neighbor somewhat more than himself, which will initiate the work and will carry it on. For the physician, more truly than most men, remains still his brother's keeper.

Social consciousness, which started Dorothea Dix on her life mission and drove Clara Barton to the battlefield of Antietam, is the factor that induced every good doctor and every other worker in the vineyard of human relations to assume his or her particular responsibilities, and that makes civilized man of today somewhat different from his ancestor of fifty centuries ago.

It is a foregone conclusion that any agency that actually promotes good medical care in a sound and effective and ethical manner deserves the unbiased appraisal and the unstinted support of the profession. It should also be a foregone conclusion that the best public relations are the good private relations that exist between physicians and between each physician and his patients. There is no more place in this country than in any other for self-congratulation on the quality of the medical care that has been developed, until the utmost has been achieved in making it available to all levels of society, in all places and at all times. In working toward this fulfillment of the traditions to which we are heir, may our Massachusetts Medical Society and our *Journal* hew always to the line! With this there must be no compromise.

Let me repeat again, in concluding, the words of Oliver Wendell Holmes on this same occasion, ninety-two years ago this month:

> To cultivate that mutual respect of which outward courtesy is the sign, to work together, to feel together, to take counsel together for the truth, now, always, here, everywhere; for this our fathers instituted and we accept, the offices and duties of this time-honored Society.

DUPUYTREN'S CONTRACTURE*

With a Note on the Use of the "Compression Suture"

RADFORD C. TANZER, M.D.†

HANOVER, NEW HAMPSHIRE

SPONTANEOUS contraction of the palmar fascia was first described by Plater in 1610, and its surgical correction by subcutaneous fasciotomy was mentioned by Sir Astley Cooper in 1818, but the observations of Baron Dupuytren[1] in 1831 concerning the true nature of the disease have rightfully led to its association with his name. Since then a similar but less frequent involvement of the plantar fascia has been described, and an occasional association with progressive contraction of the penis (Peyronie's disease) has been noted.[2]

INCIDENCE

Dupuytren's contracture is essentially a hereditary disease of adults, occurring nine times as frequently in males as in females but rarely among Negroes or Orientals. Since it becomes manifest in the later decades, statistics vary according to the selection of material for analysis. Schnitzler[3] found it present in 1.7 per cent of 80,000 patients of a Munich hospital; Bunnell has placed the incidence between 1 and 2 per cent of the population. Skoog,[4] totaling the figures of 11 authors with his own group of 50 cases, obtained an age distribution as shown in Table 1.

ANATOMY OF PALMAR FASCIA

Dissections of the palmar fascia by Kanavel, Koch and Mason,[5] Kaplan[6] and others have clarified the arrangement and function of this complex structure. The fascia of the hand consists of four parts — the superficial palmar fascia (or palmar aponeurosis) and the deep palmar, digital and dorsal fasciae. The aponeurosis, which is the portion most significantly involved in spontaneous contracture, is a firm membrane, triangular in shape, arising proximally as an extension of the palmaris longus or, in its absence, of the antebrachial fascia, and fanning out across the palm in distinct longitudinal bands that gain attachment to the deeper layers of skin proximal to the webs and continue into the bases of the fingers as the superficial digital fascia. The aponeurosis is strengthened by transverse fibers, particularly in the distal portion of the palm, where they form two condensations, the interdigital ligaments of the finger webs (Gerdy's natatory ligaments) and, more proximally, a band in the region of the distal palmar crease. Superficial fibers run vertically and obliquely to the skin, binding the latter to the aponeurosis, and in particularly well developed areas, as at the level of the metacarpal heads, creating the palmar creases. The aponeurosis is more sturdily developed along the ulnar side but maintains a firm character as far laterally as the web between thumb and index finger, and in 32 per cent of cases[7] extends onto the thumb. Deep to the flexor tendons the deep palmar (or volar interosseous) fascia stretches across the cup of the palm where it attaches to the metacarpal bones and, in the region of the metacarpal heads, thickens to form the transverse metacarpal ligament.

TABLE 1. *Distribution of Dupuytren's Contracture According to Age Group (662 Cases Compiled from 11 Authors by Skoog[4]).*

Age	0–19	20–29	30–39	40–49	50–59	60–69	70–79	80–89
No. of cases	21	57	114	119	166	141	41	3

Between the superficial and deep palmar fasciae a series of septa are developed along the sides of the flexor tendons, forming 8 compartments in which the tendons and the associated neurovascular bundles are contained. In the proximal portion of the palm these vertical septa are in close contact, but distally, as the tendons diverge, they become separated and are attached to the transverse metacarpal ligament and to the capsules of the metacarpophalangeal joints, with a few fibers extending between the heads of the metacarpal bones and attaching in a crossed pattern to the dorsal aponeurosis.

The digital fascia, according to the studies of Kanavel, Koch and Mason,[5] is composed of two layers. The deep layer is a continuation of the previously described paratendinous septa and joins the sides of the phalanges near the attachments of the vaginal sheath, aponeurosis of the extensor tendon and insertion of the interosseous and lumbrical muscles. Fibers have also been demonstrated[4] extending obliquely in a dorsal direction as far as the base of the middle phalanx. The superficial digital fascia represents an extension of the superficial palmar fascia; it extends completely around the digit and with the deep digital fascia forms a compartment in which the digital nerves and vessels are encased. The palmar aponeurosis serves as a protection for the important components of the hand but even more significantly acts as a skin-stabilizing mechanism by means of its connecting fibers, so that the skin does not slide loosely on its base when the hand is used for gripping.

*Presented before the annual meeting of the New England Surgical Society, York Harbor, Maine, September 1951.

From the Plastic Surgery Section of the Hitchcock Clinic, Hanover, and the Veterans Administration Hospital, White River Junction, Vermont.

Published by permission of chief medical director, Department of Medicine and Surgery, Veterans Administration, who assumes no responsibility for the opinions expressed or conclusions drawn by the author.

†Assistant professor of plastic surgery, Dartmouth Medical School; chief of plastic surgery, Hitchcock Clinic; area consultant in plastic surgery, Veterans Administration.

Pathology

The disease begins characteristically with the appearance of small, thickened plaques in the palm, usually in the distal palmar crease overlying the tendon to the ring or little finger, and with the development of longitudinal bands that over a period of months or years produce progressive contraction of the associated fingers, involving primarily the metacarpophalangeal and at times the proximal phalangeal joints. Later in the disease the index and middle fingers may become similarly but less extensively involved; in more unusual circumstances the thumb may undergo contracture.

A cross section of the early discrete plaque reveals skin characterized by thickening of the corneal layer of the epidermis, flattening of the papillae and replacement of the normal dermal architecture by fibrous tissue. This altered integument merges with a firm, grayish-white nodule of fibrous tissue that has supplanted the normal fatty subcutaneous layer between skin and palmar aponeurosis. A later stage shows a similar thickening of the longitudinal bands of the aponeurosis combined with a diffuse involvement of the vertical septa, binding the scarred aponeurosis down securely about the flexor tendons but never actually involving tendons. Bizarre extensions of the disease may involve the proximal phalanx, displacing digital nerves and vessels toward the opposite side or at times building up thick masses of scar that become intimately and diffusely fused with overlying skin.

Microscopical studies have failed to produce a tenable theory concerning the true nature of this contraction. Langhans in 1887 described an actual inflammatory process involving both palmar aponeurosis and adjacent connective tissues, particularly the adventitia of blood vessels. Nichols[8] and Janssen[9] believed that the disease was essentially a focal hypertrophy of connective tissue originating in vessel walls, resolving as the lesion became more fully developed into dense tissue histologically similar to normal fascia.

Meyerding and his co-workers[10] came to the conclusion that the pathologic process starts primarily in the interstitial connective tissue and spreads to the other tissues of the palm. They noted signs of inflammation and proliferation of capillaries and fibroblasts in the skin, subcutaneous tissue and interstitial connective tissue, but in the palmar fascia they found only fibroblastic proliferation without other signs of inflammation. It was their opinion that the degree of cellular proliferation was inversely proportional to the maturity of the process; they graded specimens on this basis in an attempt to correlate degree of maturity with clinical behavior.

Horwitz[11] pointed out the histologic similarity of this disease to other fibroplasias, such as the keloid and fascial desmoid. Skoog,[4] in a microscopical study of 29 specimens, confirmed the original observations of Nichols and Janssen about the focal nature of the process and went so far as to consider these localized hypercellular areas pathognomonic of the disease. The presence of many interruptions in continuity of the fiber bundles in these areas has led him to the conclusion that the trauma of stretching precipitates rupture of these fasciculi, leading to a vicious circle, with contraction of the digit as its end result.

Etiology

Though the basic cause of Dupuytren's contracture is unknown, several significant features emerge through the welter of speculation. In the first place, there is an unquestioned hereditary predisposition to the disease. Eight hundred and thirty-three cases reported by 15 authors and totaled by Skoog show an incidence of 17 per cent familial occurrence. In the latter's own group of 50 cases, in which careful inquiry into family history was made, 44 per cent indicated involvement among others in the family. Males are predominantly affected.

The significance of trauma as a causative agent is not so clear cut. Dupuytren himself ascribed the disease to occupational trauma, and some evidence has been offered[4] to indicate that the incidence is higher among workers doing heavy manual work than among those doing light or no manual work. Skoog believes strongly that repeated trauma or even single injury will precipitate the disease in persons in whom a predisposition exists, but the majority of observers discount trauma as an important factor.

An intriguing explanation was advanced in 1921 by Krogius[12] who suggested that palmar contracture represents a tendinous degeneration of the atavistic remnants of the superficial flexores breves muscles in the hand. This set of muscles, present in many of the lower mammals, serves as the third set of flexors of the digits, attaching to the proximal phalanges and primarily flexing the metacarpophalangeal joints. It may be presumed that the palmaris longus muscle and the palmar aponeurosis, as well as the plantaris muscle and the central portion of the plantar fascia, are vestigial elements of this once powerful muscle. Krogius' claim of finding islets of muscle tissue in the aponeurosis of the newborn infant has given support to his theory, but this finding has not as yet been confirmed.

Attempts have been made to correlate the findings in a group of diseases, including contractures of the palmar and plantar aponeuroses, induratio penis plastica (Peyronie's disease) and keloid. Contracture of the plantar fascia, though much less frequent than its counterpart in the palm, has been found associated with the latter in statistically significant percentages by Kanavel and his colleagues, Bunnell and others. Microscopically the two affections are similar, but grossly the disease involves only the medial aspect of the plantar aponeurosis. Bunnell encountered localized fibrous

thickening of the penis three times in a series of 87 cases of Dupuytren's contracture.

A curious association between Dupuytren's contracture and epilepsy was reported by Lund[13] in 1941 — namely, an incidence of 50 per cent of hand contractions among a group of 190 male epileptics and 25 per cent among 171 females. Stimulated by this report, Skoog reviewed a Swedish group of 207 male epileptics, among whom the incidence of contracture was 42 per cent. It is presumed that the hereditary predisposition toward hand contracture exists concurrently with that toward epilepsy, but the cause of this surprising combination has not been determined. All of the latter's patients have been on a phenobarbital regimen for several years, which is thought to be a possible but unexplained cause of the association.

Diagnosis

The diagnosis of this condition is rarely in doubt. In its earliest forms there may be some confusion with simple callus; in the routine examination of Dartmouth College students we have occasionally found faint areas of palmar thickening that are probably the harbingers of full-blown Dupuytren's contracture but in which the certainty of diagnosis is lacking.

The localized hardened plaque of skin appearing along the ulnar side of the distal palmar crease, later creating crescentic dimpling of the adjacent skin as contracting scar pulls it firmly down onto the aponeurosis, is an almost pathognomonic feature. The base of the ring finger is usually the first to demonstrate changes, followed with decreasing frequency by the little, middle and index fingers and the thumb. A plaque involving the base of both ring and little fingers is a common combination. As the process continues, limitation in extension of the affected fingers intervenes, usually associated with the formation of longitudinal subcutaneous bands that can be felt and frequently seen in the palm, and extending up into the proximal phalanges. In addition to bands, the latter are prone to display a diffuse thickening that spreads over the entire volar aspect and may extend into the middle but rarely into the distal phalanges. Pain is unusual, although in the early proliferative stages mild discomfort is occasionally elicited.

Starting typically in one hand, the disease may progress at varying rates. In general it is a slowly progressive disease, terminating in severe flexion contractures only after a number of years. It is not unusual, however, to note measurable increase in contractures over a period of several months, and at times the disease shows changing rates of growth from year to year. Kanavel and others,[5] tabulating the figures of 6 authors, found the incidence of unilateral and bilateral disease to be roughly the same (these figures presumably representing the status at the time of consultation). Of the unilateral group, the right hand was involved twice as frequently as the left.

The more overt forms of the disease may possibly be mistaken for congenital contractures of the fingers, spastic contraction or flexor contracture due to injury or infection. In all these latter conditions the typical dimpled palmar thickening of Dupuytren's contracture is absent. Furthermore, shortening of the flexor tendons is a usual occurrence in this group and is readily demonstrated by flexing the wrist, which relieves tension on flexor tendons and permits the finger joints to straighten. A flexor contracture of the Dupuytren's type, caused primarily by subcutaneous bands, will not demonstrate such release of finger joints by simple wrist positioning.

Treatment

Several nonoperative approaches have been applied to Dupuytren's contracture, with indifferent results. Radiotherapy at best has shown only occasional temporary arrest in the early cellular phase. Vitamin E has been advocated in the treatment of early forms of the disease. Steinberg[14] found that 6 of 7 cases treated by doses of 300 mg. of Vitamin E daily were improved during the period of treatment, which extended over several weeks, but no long-range follow-up studies were reported. King[15] was unable to obtain any measurable effect with Vitamin E, although patients occasionally noted some subjective improvement; he advised against the use of the tocopherols in this condition.

The status of cortisone in the treatment of Dupuytren's contracture is still undetermined. Baxter and his associates[16] successfully treated by this method a patient with Dupuytren's contracture, in whom disabling fibrosis developed postoperatively, but no relation of the effect of cortisone to the primary disease was implied.

In spite of these and many other attempts to provide a nonoperative cure, the fundamental concept of treatment as laid down by Dupuytren is still the method of choice. His original approach consisted of multiple divisions of the contracting bands together with the overlying skin followed by splinting the fingers in extension and maintaining this position during the contractile phase of healing by secondary intention. Twenty years later Fergusson[17] emphasized the necessity of *excising* the contracted fascial bands in order to avoid recurrence, but it remained for Lexer[18] to carry this concept to its logical conclusion by routinely carrying out a complete excision of the palmar aponeurosis. The majority of surgeons adhere to this concept today, although there has been a recent tendency to seek less drastic procedures that might give acceptable results.

Subcutaneous fasciotomy, which had been practiced widely during the nineteenth century, was virtually abandoned as aseptic technic reduced the undesirable effects of the open methods. Bunnell[3] has recently advocated the subcutaneous division of bands in the severely contracted hand as a pre-

liminary to the more radical procedure. Luck, in a presentation before the Society for Surgery of the Hand in 1950 (unpublished), offered a brief for the use of subcutaneous fasciotomy in selected cases, particularly in elderly persons whose general condition contraindicates the more permanent correction.

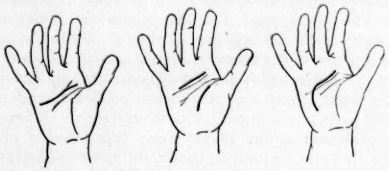

FIGURE 1. *Commonly Used Operative Approaches for the Correction of Dupuytren's Contracture.*
I = *Gill, Kanavel;* II = *Davis and Finesilver;* III = *Meyerding, Bunnell.*

Having accepted the desirability of thorough removal of the aponeurosis, one is confronted with the question of the optimum time for operation. Theoretically, one might be tempted to remove the entire fascia as soon as the diagnosis is made in order to avoid further involvement of overlying skin. From a practical standpoint, however, it is generally conceded that a period of observation in those cases without significant skin involvement or contracture is preferable. Meyerding and others,[10] although not presenting their evidence as conclusive, found that in those cases in which disease recurred the excised specimen tended to be of the immature type with a more cellular histologic appearance, which is characteristic of the early stages of the disease. Of perhaps more importance is the necessity of obtaining the patient's confidence in the operative procedure. The postoperative course is frequently rather protracted, with a prolonged period of stiffness and temporary disability. Unless a patient has had an opportunity to observe the progressive nature of his disease he may view his operative procedure as unnecessarily drastic and may delay treatment of disease developing in the opposite hand for an unreasonably long time.

The appearance of definite finger contracture is a substantial indication for operation. One should also proceed before fibrosis of the skin has advanced to a point where the separation of skin from scar bands at operation produces devitalization, with a resultant need for replacement by skin graft.

Another consideration is the treatment of uninvolved fingers. Whereas most operators insist on complete dissection of the aponeurosis in the palm with the possible exception of the fibers extending into the base of the thumb, it is not considered essential to strip the fascia from fingers showing no evidence of thickening in the proximal phalanges. Provided that the fascia is removed well up into the distal aspect of the palm, any bands later developing in the fingers themselves can be corrected by a minor and relatively innocuous procedure.

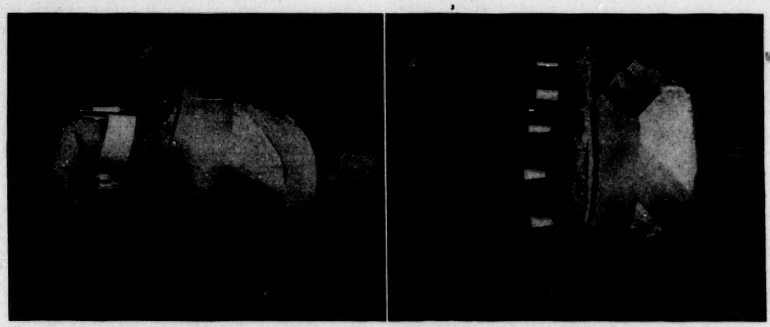

FIGURE 2. *A Modification of the Dorsal Splint Described by Bunnell for Postoperative Immobilization of the Metacarpophalangeal Joints in Extension.*
A piece of welding rod bent into multiple loops and embedded in plaster of Paris offers a frame on which a sling of web strapping is adjusted to support the proximal phalanges.

OPERATIVE TECHNIC

A bloodless field is essential, since the separation of digital nerves and vessels from the encasing fibrous masses is at best a difficult undertaking. At least a dozen incisions have been advocated to expose the palmar fascia; three of these are in general use today (Fig. 1). An approach originally described by Gill[19] in 1919 and later used by Kanavel consists of a straight incision extending transversely in the line of the distal palmar crease, from which the proximal components of the aponeurosis can be visualized by wide undermining. This approach has

been popularized in England by McIndoe and has recently been advanced in this country by Adams.[20]

Davis and Finesilver[21] used a double incision, one extending along the distal palmar crease and the other following the curved base of the thenar eminence. While giving a more adequate exposure of the entire aponeurosis than the single incision it also affords adequate protection of the blood supply of the skin flaps. Perhaps the most common approach is an L-shaped incision described by Meyerding[22] in 1936 and favored by Bunnell. The line parallels the distal palmar crease, then turns along the ulnar side of the palm and continues proximally to permit exposure of the attachment of the aponeurosis to the transverse carpal ligament.

Whatever approach may be used, the aponeurosis is first separated throughout the palm from the overlying skin and remaining subcutaneous tissue while still under tension, in order to facilitate the dissection and is then divided from its proximal attachment, giving immediate relaxation, and carried forward en bloc. At the point of bifurcation of the tendinous bands, the intertendinous septa become visible as they form partitions between the tendons and neurovascular bundles. Longitudinal incisions along these septa detach them from the deep palmar fascia.

The dissection is now carried beneath the distal skin flap, carefully separating skin from fibrous plaques and freeing the deep band-like extensions from the transverse metacarpal ligament.

To complete the dissection, any involved fingers must be opened at the proximal phalanges to permit linking with the palmar incision. A midlateral incision may be employed on one or both sides of the finger or, as we have found more convenient, a single midlateral incision is extended by a right-angled line just proximal to the first phalangeal joint, being carried far enough to the opposite side to permit complete access to the fascia on that side. This type of approach can then be extended farther as a bayonet incision if the middle phalanx displays thickened bands. The plaque of scar may be found superficial or deep to the nerves or completely surrounding them; occasionally it may have drawn the nerves far from their usual positions. This block of scar is dissected from its bed until it is finally drawn back into the palm to complete the removal of the entire aponeurosis en bloc.

The vascularity of the skin flaps is next evaluated, and any patently devitalized skin is removed and replaced by a full-thickness skin graft taken from the medial aspect of the upper arm. The practice of grafting, prevalent during the past twenty or thirty years, is now becoming less frequent, due to refinements in dissection of the skin flaps and perhaps to the more expeditious treatment of the disease before extensive contractures have occurred. In case of reasonable doubt, it is certainly better to utilize a free graft than to incur the risk of cicatricial contracture secondary to skin loss.

After careful hemostasis the wounds are closed and rubber drains brought out on either side or both

FIGURE 3. *Use of the "Compression Suture" to Prevent Postoperative Hematoma.*

A = *A mattress suture of silk introduced before the final closure of the transverse palmar incision transfixes the hand through two intermetacarpal spaces.* B = *Fluffed gauze has been carefully packed within and around the silk loop and is drawn down into the cup of the palm over a button.* C = *The mattress suture is tied over a pad of fluffed gauze on the dorsum of the hand and the hand packed in functional position with the same material.*

sides of the palm, attached to silk threads by which they can be extracted on the following day without disturbing the dressing. Careful packing of the palm and fingers with fluffed gauze or surgical waste and the application of an elastic pressure dressing and posterior plaster splint complete the procedure.

Postoperatively the hand is immobilized for a week to ten days, after which active exercise is started. Because of the extensive undermining in the palm and sometimes because of localized areas of skin necrosis, motion in the metacarpophalangeal joints is contraindicated. In order to permit activation of the fingers while keeping these proximal joints at rest, a dorsal splint described by Bunnell is used. A serviceable splint, shown in Figure 2, can be fabricated from plaster and welding rod in a few minutes and is quite effective in putting the susceptible palmar skin at rest.

Author's Modification

One of the complications that has been most distressing in the author's experience and that is frequently mentioned in articles on this subject is the development of postoperative hematoma beneath the palmar flap. Even though hemostasis has been most thorough a large potential space has been created, a space that, because of the removal of a thick aponeurosis, requires inward stretching of the skin to obliterate. The usual compression dressing created by wrapping an elastic bandage about the padded palm tends to narrow the carpal arch and so intensifies the concavity of the palmar defect. To overcome this undesirable distortion, one may include a flat plate of some material such as dental-impression compound in the external part of the palmar dressing and extending slightly beyond the second and fifth metacarpal bones, so that when hardened the plate will resist the tendency of the elastic bandage to narrow the arch. This is in effect the "sandwich dressing" to which Frackelton[23] has alluded.

To accomplish the same purpose more effectively the author has for the past two years used a so-called "compression suture"[24] which pulls the palmar dressing down into the cup of the palm at a point that is most efficacious in preventing the accumulation of fluid (Fig. 3). Before the skin incisions are closed a mattress suture of No. 3-0 silk, double-armed on straight needles and incorporating a button, is passed directly through the hand at two points. The first needle penetrates the skin between the second and third metacarpal bones, passes under direct vision to one side of the neurovascular bundle and pierces the intermetacarpal space at a level far enough distalward to avoid the deep volar arch and ulnar nerve, emerging through the dorsal skin. The second needle is introduced in the same manner between the fourth and fifth metacarpal bones. After the wound closure is completed, packing is carefully introduced beneath and around the silk loop in the palm and the button is drawn onto the packing by gathering up on the dorsum of the hand the two suture ends, which are threaded through a second button and tied with moderate firmness over gauze to maintain snug pressure. A conventional fluffy dressing with elastic-bandage support is then built up around the compression suture and is left undisturbed for seven to ten days, at the end of which time it is usual to begin gentle but restricted exercises with the aid of the previously described extension splint.

During the past four years twelve hands displaying Dupuytren's contracture have undergone operative correction on the plastic services of the Hitchcock Clinic and the White River Junction Veterans Hospital. The compression suture was used in half of these cases, but in other respects the treatment was similar. Of the 6 cases treated with a conventional operative dressing, 2 cases healed without any untoward results, 2 presented moderate thickening in the palm and 2 gave evidence of frank hematoma that required evacuation of the clot. Although all these cases developed satisfactory function eventually, convalescence in the latter 4 cases was substantially prolonged.

Of the 6 cases treated by use of the compression suture, 5 healed promptly, with no evidence of hematoma or bogginess. A sixth case in which the compression suture was introduced through adjacent intermetacarpal spaces, rather than by the described method, developed a small localized collection of blood. We have been impressed by the conspicuous absence of edema and the quick return of function in the group treated with the "compression suture" as contrasted with the group dressed by conventional methods.

Summary and Conclusions

Dupuytren's contracture is a hereditary disease of adult males, affecting between 1 and 2 per cent of the population.

Although the gross picture of progressive fibrous contraction of the palmar aponeurosis and its extensions is well recognized, the causative factor is still obscure, as is its relation to a similar affection of the plantar aponeurosis and to induratio plastica penis (Peyronie's disease). Likewise, the curious association between Dupuytren's contracture and epilepsy has not been satisfactorily explained.

Nonoperative measures have proved ineffective in producing a significant reversal of the fibrosis. Subcutaneous fasciotomy offers palliative relief, but permanent correction requires a thorough resection of the involved aponeurosis.

A method of surgical correction utilizing a so-called "compression suture" has been successfully employed in eliminating postoperative bogginess and hematoma, which have frequently prolonged convalescence after resection of the palmar aponeurosis.

2 Maynard Road

References

1. Dupuytren, G. Leçons orales de clinique chirurgicale, faites à l'Hôtel-Dieu de Paris. 602 pp. Paris: Germer-Baillière, 1832-4. *Clinical Lectures on Surgery, Delivered at Hotel-Dieu in 1832.* Translated by A. Sidney Doane. 312 pp. New York: Collins and Hannay, 1833.
2. Bunnell, S. *Surgery of the Hand.* Second edition. 930 pp. Philadelphia: J. B. Lippincott Company, 1949.
3. Schnitzler, O. Bedeutung von Berufs- und Sportschäden bei Morbus Dupuytren. *München. med. Wchnschr.* **82**:248, 1935.
4. Skoog, T. Dupuytren's contraction, with special reference to aetiology and improved surgical treatment: its occurrence in epileptics: note on knuckle-pads. *Acta chir. Scandinav.* **96**(Supp. 139): 1-190, 1948.
5. Kanavel, A. B., Koch, S. L., and Mason, M. L. Dupuytren's contraction, with description of palmar fascia, review of literature, and report of 29 surgically treated cases. *Surg., Gynec. & Obst.* **48**: 145-190, 1929.
6. Kaplan, E. B. Palmar fascia in connection with Dupuytren's contracture. *Surgery* **4**:415-422, 1949.
7. Kalberg, W. Zur Anatomie der Palmaraponeurose. *Anat. Anz.* **81**: 149-159, 1935.
8. Nichols, J. B. Histology of Dupuytren's contraction of palmar fascia. *M. News* **75**:491-493, 1899.
9. Janssen, P. Zur Lehre von der Dupuytren'schen Fingercontractur, mit besonderer Berücksichtigung der operativen Beseitigung und der pathologischen Anatomie des Leidens. *Arch. f. klin. Chir.* **67**: 761-789, 1902.
10. Meyerding, H. W., Black, J. R., and Broders, A. C. Etiology and pathology of Dupuytren's contracture. *Surg., Gynec. & Obst.* **72**: 582-590, 1941.
11. Horwitz, T. Dupuytren's contracture: consideration of anatomy of fibrous structures of hand in relation to this condition with interpretation of histology. *Arch. Surg.* **44**:687-706, 1942.
12. Krogius, A. Studien und Betrachtungen über die Pathogenese der Dupuytren'schen Fingerkontraktur. *Acta chir. Scandinav.* **54**: 33-50, 1921.
13. Lund, M. Dupuytren's contracture and epilepsy: clinical connection between Dupuytren's contracture, fibroma plantae, periarthrosis humeri, helodermia, induratio penis plastica and epilepsy, with attempt at pathogenetic valuation. *Acta psychiat. et neurol.* **16**: 465-492, 1941.
14. Steinberg, C. L. New method of treatment of Dupuytren's contracture, form of fibrositis. *M. Clin. North America* **37**:221-231, 1946.
15. King, R. A. Vitamin E therapy in Dupuytren's contracture: examination of claim that vitamin therapy is successful. *J. Bone & Joint Surg.* **31-B**:443, 1949.
16. Baxter, H., Johnson, L., Mader, V., and Schiller, C. Cortisone as adjunct in treatment of postoperative stiffness of hand. *Canad. M. A. J.* **63**:540-543, 1950.
17. Fergusson, W. *A System of Practical Surgery.* 621 pp. Fourth American from third London edition. Philadelphia: Blanchard and Lea, 1853.
18. Lexer, E. Die gesamte Wiederherstellungschirurgie. Second edition. 896 pp. Leipzig: Johann Ambrosius Barth, 1931. P. 837.
19. Gill, A. B. Dupuytren's contracture, with description of method of operation. *Ann. Surg.* **77**:221-225, 1919.
20. Adams, H. D. Dupuytren's contracture. *S. Clin. North America* **22**: 899-906, 1942.
21. Davis, J. S., and Finesilver, E. M. Dupuytren's contraction, with note on incidence of contraction in diabetes. *Arch. Surg.* **24**:933-989, 1932.
22. Meyerding, H. W. Dupuytren's contracture. *Arch. Surg.* **32**:320-333, 1936.
23. Frackelton, W. Discussion of group of papers on Dupuytren's contracture. Annual Meeting of Society for Surgery of the Hand. Chicago, January, 1951.
24. Tanzer, R. C. Prevention of postoperative hematoma with note on use of compression suture. *Proceedings of the Forum Sessions, American College of Surgeons* **2**:210-214, 1951.

Additional References

Jones, F. W. *The Principles of Anatomy as Seen in the Hand.* Second edition. 418 pp. Baltimore: Williams and Wilkins Company, 1942.

Mason, M. L. Dupuytren's contracture. *S. Clin. North America* **32**: 233-245, 1952.

MALIGNANT MELANOMA

A Clinicopathological Study

HERBERT FANGER, M.D.,† AND WESLEY F. ROBERTS, M.D.‡

PROVIDENCE, RHODE ISLAND

ALTHOUGH there have been several important contributions to the literature dealing with the pathology and treatment of malignant melanoma,[1-12] any addition to the general body of experience with these treacherous tumors is highly desirable. A total of 47 cases of malignant melanoma are in the files of the Tumor Clinic of the Rhode Island Hospital for the years 1932-1948. Of these 26 have been included in a study limited to primary lesions of the skin and mucous membrane. The remainder have been deleted because many were terminal cases when first seen or were recent cases, not enabling adequate follow-up.

Table 1 lists the various statistics of these cases, the majority of which occurred in the fifth, sixth and seventh decades. The sites of the tumors were varied; in order of frequency they were: lower extremity (12), face (5) and upper extremity (2). The increased incidence on the extremities, especially of the feet, is in agreement with the general impression gained from a survey of the literature. Unusual sites were: 1 in the cervix uteri, 1 in the vaginal wall, 1 in the nasal septum and 1 in the mouth.

The rarity of this disease in Negroes is suggested by our finding of only 1 Negro in 26 patients examined.

*From the Institute of Pathology, Rhode Island Hospital.

†Instructor in pathology, Boston University School of Medicine; director, Institute of Pathology, Rhode Island Hospital.

‡Resident in pathology, Institute of Pathology, Rhode Island Hospital.

Excluding the 7 cases with metastases when first seen, the average interval between the diagnosis and demonstrable metastasis was eleven months. The range was from one to thirty-six months.

The average survival time after the occurrence of metastases was twenty-five months. The average total survival time (the time from initial diagnosis to exitus or last follow-up examination) was forty-one months.

We have been impressed by the marked variation in the histologic pattern in the tumors examined. This had also been shown by Harvey, Dawson and Innes.[2] It is impressive to note how a malignant melanoma may mimic other types of neoplasms such as fibrosarcoma, epidermoid carcinoma and occasionally malignant lymphoma of the Hodgkin's-sarcoma type. This emphasizes the need of including malignant melanomas in the histologic differential diagnosis of neoplasms even in the absence of pigment. This is of paramount importance in the case of fibrosarcomas of the lower extremity. Careful search should be made for melanin pigment, which may be the only initial clue to the true nature of the tumor.

We have tabulated certain of the microscopical features of the malignant melanomas, using a quantitative grade of + to ++++ for each characteristic. The degree of anaplasia, though correlating somewhat with ultimate outcome, does not per-

mit its use as a reliable prognostic aid. For example, whereas Case TC-5590 was graded ++ and was alive and well five years later, Case TC-4972 was similarly graded ++ and died twenty-five months after the initial diagnosis. Case TC-8168 was graded ++++ and, though having multiple recurrences, was alive forty-eight months after the total of four or more years from the time of initial diagnosis. Only 3 of these had no recurrences or metastases. Although these figures are not statistically significant, they nevertheless emphasize the fact that a malignant melanoma is not invariably fatal and that even in those cases in which death ensues this may occur at considerable intervals

TABLE 1. *Data on 26 Cases of Malignant Melanoma.*

Case No.	Age	Sex	Interval before Metastases	Survival after Metastases	Total Period of Survival	Anaplasia	Mitoses	Giant Cells	Pigment
634	65	F	11 mo.	6 mo.	17 mo.	3+	0	3+	2+
1837	70	M	30 mo.	2 mo.	32 mo.	3+	2+	1+	2+
3945	52	M			48 mo.	2+	0	1+	2+
3996	57	F	11 mo.	130 mo.	140+ mo.	2+	0	1+	1+
4055	42	F	First seen	13 mo.	13 mo.	2+	1+	1+	2+
4094	63	F			9 yr. 5 mo.	2+	1+	1+	2+
4972	80	F	13 mo.	6 mo.	19 mo.	2+	1+	1+	2+
4979	67	M	9 mo.	8 mo.	17 mo.	1+	0	0	3+
5098	50	F			10 yr.	2+	1+	0	2+
5520	72	M	First seen	6 mo.	6 mo.	3+	1+	1+	1+
5590	46	M	8 mo.	84 mo	92 mo.	2+	1+	2+	1+
5733	25	F	4 mo.	60 mo.	64 mo.	3+	0	1+	2+
5975	52	F	First seen	77 mo.	77 mo.	3+	0	0	1+
6003	77	F	1 mo.	42 mo.	43 mo.	3+	2+	1+	1+
6085	70	F			30 mo.	2+	1+	0	4+
6222	54	M	12 mo.	7 mo.	19 mo.	3+	1+	1+	0
6601	51	M	First seen	7 mo.	7 mo.	2+	1+	0	4+
6830	65	M	4 mo.	15 mo.	19 mo.	3+	0	0	2+
7178	76	M	First seen	21 mo.	21 mo.	2+	3+	0	3+
7490	27	F	First seen	12 mo.	12 mo.	3+	2+	1+	1+
7784	57	M	First seen	13 mo.	13 mo.	4+	0	3+	4+
8168	64	F	36 mo.	12 mo.	48 mo.	4+	1+	1+	2+
8265	86	M			48 mo.	1+	1+	1+	2+
8382	62	F	12 mo.	90 mo.	102 mo.	3+	0	0	1+
8393	54	F	6 mo.	12 mo.	18 mo.	3+	3+	2+	0+
8774	44	F	First seen	5 mo.	5 mo.	3+	0	0	3+

TABLE 1 (*Concluded*).

Case No.	Site	Remarks
634	Chest	Local excision; axillary nodes involved 11 mo. later. No treatment.
1837	Face	Local excision; lymph-node and lung metastases 30 mo. later, treated by x-ray. Death 2 mo. later.
3945	Face	Local excision; no recurrence in 4 yr. when lost to further follow-up, 1943.
3996	Foot*	Local excision; recurrences and lymph nodes excised 2, 9 and 12 yr. later. Living and well now.
4055	Foot	Local excision; node metastases when first seen. Radical groin in 9 mo., death 4 mo. later.
4094	Foot	Local excision; no recurrences. Died of arteriosclerotic heart disease 4½ years later.
4972	Face	Local excision; x-ray. Recurrence in 13 mo. Treated by x-ray. Death in 6 mo.
4979	Face	Local excision; lymph nodes excised 9 mo. later. Death in 8 mo.
5098	Cervix	Local excision; no metastases. Living and well.
5520	Foot	Excision and x-ray; multiple recurrences and death in 6 mo.
5590	Chest	Local excision; multiple recurrences excised in next 30 mo. Living and well.
5733	Foot	Local excision; multiple recurrences removed, but none when last seen in 1948.
5975	Foot	Excision of metastatic node. No recurrences when last seen in 1949.
6003	Foot	Local excision; lymph-node metastases — 1 mo. radical groin. No recurrence when died 14 yr. later.
6085	Face	Local excision; died 30 mo. later with no metastases.
6222	Mouth	X-ray treatment. Died in 19 mo. with apparent liver metastases.
6601	Arm	Local excision and radical lymph-node excision; death in 7 mo.
6830	Arm	Local excision and radical lymph-node excision; death in 19 mo.
7178	Foot	Radical lymph-node resection 5 mo. after initial visit. Death 16 mo. later.
7490	Foot	Multiple recurrences and metastases excised. Death in 12 mo.
7784	Foot	Excision and radical lymph-node excision; apparent cerebral metastases and death in 13 mo.
8168	Vagina	Local excision; recurrence 36 mo. later; alive, but apparent lung metastases.
8265	Foot	Biopsy only; refused operation; living and well — no recurrences.
8382	Foot	Recurrence in stump. Leg amputation 6 yr. previously for melanoma diagnosed elsewhere.
8393	Nasal septum	Still living 3 yr. after subtrochanteric reamputation. Excision; multiple recurrences and death in 18 mo.
8774	Foot	Lung metastases when first seen. Death in 5 mo.

*"Foot" refers to sites on either foot or lower leg.

initial diagnosis. Quantitative variations in number of mitoses, giant cells and pigment production do not bear a significant relation to prognosis. The tumors were almost invariably junctional, in that the atypical nevus cells were found in the basal layers of the epidermis as well as in the corium.

Malignant melanoma and rapid death are almost synonymous in the minds of most persons. Of interest is the fact that in the group selected for study 10 out of 26 (38 per cent) have survived a after the initial diagnosis. The presence of recurrences and metastases is sometimes compatible with life for a considerable time. Thus, Case TC-5733 had a lesion of the left leg that was excised and then treated with x-ray. Multiple lesions of the face, arms and legs occurred and were excised during the next five years. The patient was living and well six years after the initial diagnosis.

As in the case of malignant tumors of the breast, five-year survival without recurrence in the case of

malignant melanomas does not mean a cure. Thus, Case TC-3996, a fifty-seven-year-old woman, had a lesion of the foot when first seen in 1939. A local recurrence was removed in 1940 and in 1941. She was asymptomatic for six years, until a lymph-node metastasis to the groin was demonstrated. This also was excised, and four years later (1951) she had a recurrence of tumor in the groin.

It is not the purpose of this paper to evaluate methods of treatment, since the number of cases is believed too small to be significant. In the past eleven years, most of the patients with a malignant melanoma of an extremity have been treated by wide local excision as well as radical excision of the regional lymph nodes. This is also true of lesions of the trunk located in a quadrant where there appears to be a geographic relation between the local lesion and a group of lymph nodes.

It should be emphasized that malignant melanomas, though bearing a bad prognosis, are not invariably fatal and are compatible with life for a considerable period of time even with recurrence and metastases. Whether or not there is a variation of patient resistance to the neoplasm is purely theoretical. On the other hand, because this neoplasm is not invariably fatal, it behooves the surgeon to excise the lesion adequately and follow up the recurrences and metastases rather than consider the case hopeless and assume a negative attitude toward treatment.

Summary

An attempt has been made at clinicopathological correlation of malignant melanomas. It is impossible to prognosticate the eventual outcome in any single case on the basis of histologic findings.

Malignant melanomas are not invariably fatal, even with recurrences or metastases. It is emphasized, therefore, that each case should be treated vigorously and not be considered hopeless even in the presence of recurrences or metastases.

References

1. Allen, A. C. Survey of pathologic studies of cutaneous diseases during World War II. *Arch. Dermat. & Syph.* **57**:19-56, 1948.
2. Harvey, W. V., Dawson, E. K., and Innes, J. R. M. *Debatable Tumors in Human and Animal Pathology.* 124 pp. Edinburgh: Oliver and Boyd, 1940.
3. Pack, G. T. Management of pigmented nevi and malignant melanomas. *South M. J.* **40**:832-838, 1947.
4. Pack, G. T., Scharnagel, I., and Morfit, M. Principle of excision and dissection in continuity for primary and metastatic melanoma of skin. *Surgery* **17**:849-866, 1945.
5. Tod, M. C. Tragedy of malignant melanoma. *Lancet* **2**:532-534, 1944.
6. Foot, N. C. Concerning histology of melanoma. *Am. J. Path.* **8**:309-320, 1932.
7. *Idem.* Concerning histology of melanoma: with special consideration as to nervous elements of tumor. *Am. J. Path.* **8**:321-328, 1932.
8. Allen, A. C. Reorientation on histogenesis and clinical significance of cutaneous nevi and melanomas. *Cancer* **2**:28-56, 1949.
9. Spitz, S. Melanomas of childhood. *Am. J. Path.* **24**:591-609, 1948.
10. Daland, E. M., and Holmes, J. A. Malignant melanomas: clinical study. *New Eng. J. Med.* **220**:651-660, 1939.
11. Adelson, L. Malignant melanoma: clinico-pathological study: sixty-eight cases (non-ocular type) with special reference to possible prognostic factors. *Conn. State M. J.* **15**:6-14, 1951.
12. Ackerman, L. V. Malignant melanoma of skin: clinical and pathologic analysis of 75 cases. *Am. J. Clin. Path.* **18**:602-624, 1948.

MEDICAL PROGRESS

ASTHMA IN CHILDREN

A Follow-up Study of 688 Patients After an Interval of Twenty Years

FRANCIS M. RACKEMANN, M.D.,* AND MARY C. EDWARDS, R.N.

BOSTON

CONTINUED studies of asthma in children enable us to evaluate a concept previously stated, that "When asthma begins before age 30, the cause is allergy unless proved otherwise; but when asthma begins after age 40, the cause is *not* allergy unless proved otherwise."[1] A long-term follow-up study of asthma in children should result in a better understanding of clinical allergy.

There are many questions to be answered. "How often do children outgrow their asthma?" and "What will happen to my child?" are the routine questions, but others are important also. Do the original cause and type of the asthma affect the outcome? Does allergic asthma follow a uniform time pattern over the years even though the sensitiveness is directed to food and dust substances of different varieties? Does specific treatment play a part in the outcome, or is this outcome determined more by the other features, especially infections, that complicate the original simple process? What light does this study throw on the clinical aspects, especially on the treatment of asthma? Still other questions are: Is asthma in children always due to a sensitiveness to some food or dust substance as we have supposed, or is there a sensitiveness to infection — a "bacterial allergy"? Does relief of symptoms mean cure? How shall the later development of new manifestations be explained? If certain patients who first had asthma in childhood but were not seen until later adult life still have it, why is that? Does a review of their early history reveal any clue by which this later trouble could have been foretold and perhaps prevented?

The answers to these questions are not simple. The survey of 1074 patients, made by one of us[2] in 1927, gave many figures on extrinsic and intrinsic cases but did not stress children particularly. In

*Formerly, lecturer in medicine, Harvard Medical School; member, Board of Consultation, Massachusetts General Hospital.

1936 Unger[3] wrote his first paper on the results of treatment in 207 patients. Except for noting that "the older the onset, the less favorable the prognosis," he did not refer to age groups. In a later presentation,[4] however, he and his co-workers showed that of 181 patients who first had asthma before the age of ten, and were followed for seven years after the first visit as many as 30 per cent were "cured." When these figures were divided, they found that all the "cures" were in the "paroxysmal" group of 144 cases — making 38 per cent of this subgroup who were "cured." The "chronic" group, however, had no "cures" at all. Meanwhile, Flensborg,[5] in Denmark, received questionnaires from 298 children with asthma. Attacks had ceased in 40 per cent, mostly between the ages of nine and twelve in the girls and between twelve and fifteen in the boys.

In 1949 Williams and Williams[6] made a study of the natural history of asthma but made no special reference to children. Dublin and Marks[7] have reported valuable statistics on asthma, but, unfortunately, they say little about children, their chief interest being in the over-all incidence of asthma in the population, as shown by figures from the Selective Service Boards and life-insurance tables.

The data to be presented here are as accurate as the evidence permits, but there are two serious difficulties. The first concerns the diagnosis of the substance is removed the patient continues to have new head colds, but asthma no longer occurs with them. In this paper, such cases are included in the groups to which the allergy belongs.

The second difficulty concerns the follow-up. A few of the patients have been heard from at intervals and their course is well charted, but the majority have not been followed closely, and the reply to the questionnaire is not always satisfactory. Our figures are approximate only, but they show interesting trends.

The present study is based on the records of 688 children who developed asthma before the age of thirteen. Each one has been followed by letter or other means after an interval of about twenty years after the first visit. The majority were private patients, seen in the office. About two thirds of the total, — or 449 children, — were first seen before the age of thirteen and most of this report is devoted to this smaller series. It was thought that when the follow-up study includes all the children seen in childhood and hence no selection is made, the end results should give a fair percentage index of the prognosis of asthma in children. That the group is essentially complete is attested by the fact that in the whole series there are only 29 patients remaining untraced. A second section of the report deals with 239 other patients whose asthma began also in childhood, but these 239 patients were not

TABLE 1. *Original Classification and Present Status.*

ORIGINAL CAUSE OF ASTHMA	TOTAL	"CURED"	RELIEVED; STILL SENSITIVE	OTHER ALLERGY	MILD SYMPTOMS	TROUBLE NO HOSPITAL	TROUBLE HOSPITAL	DEAD
Animal	114 (25.8%)	19	55	17	13	7	0	3 (1 of asthma)
Foods	36 (8.1%)	16	10	6	0	4	0	
Pollens	21 (4.7%)	4	0	0	12	5	0	
Hay fever	(86)	(2)	(11)	(25)	(42)	(3)	(0)	(3)
Mixed and unidentified	199 (43.3%)	50	22	60	26	24	9	8 (3 of asthma)
Negative tests ("bacterial"?)	79 (17.9%)	49	0	13	17	0	0	
Totals	449 (100%)	138 (30.7%)	87 (19.3%) (71.4%)	96 (21.4%)	68 (15.1%)	40 (8.9%)	9 (2.0%) 28.4%	11 (2.4%)

exciting cause. Asthma is not often due to one single item. To be sure, there are a few "typical" cases of cat asthma, horse asthma and egg asthma, but there are only a few. In most cases, the patient is clinically sensitive to several substances at the same time. His skin tests show multiple positive reactions. There is no doubt that the cause of asthma is "extrinsic" — that the attacks are due to contact with foreign substances in the environment outside the body, but even though the symptoms occur only in a certain house or under certain special circumstances, the cause must still be described as "mixed and unidentified." "Asthmatic bronchitis" is a term that has been used to describe the situation in which the patient is sensitive but has attacks of asthma only "when new colds lower the threshold to make a slight allergy effective." When the foreign seen until some years later. This fact suggests that in childhood they were the "bad "cases, hence a selected group. Their cases serve no statistical purpose but certain observations on them serve as a check on the primary section.

ASTHMA IN CHILDREN — SEEN BEFORE THE AGE OF THIRTEEN

The 449 children under this title provide the statistics in this report. Boys outnumbered girls about 2 to 1 (297 boys against 152 girls). They have been classified according to the cause of asthma as determined at the first visit, and the end results after twenty years are presented in accord with the various diagnoses. Table 1 gives a summary of the figures.

Animal Asthma

There were 114 children, 75 boys and 39 girls, whose asthma was due primarily to contact with animals. Next to the mixed group, this is the largest. Nineteen of these children, or 16.6 per cent of the animal cases, are now "cured." Table 2 gives the details of the ages at onset, first visit, "cure" and follow-up; it includes a word about the treatment. In each case exposure to animals has occurred from time to time, but no symptoms have developed. For example:

W. K., Jr. (Case 18, Table 2) developed asthma at the age of 9. He was studied at 13 and was found very sensitive to horses, as well as to cats and to ragweed. He was treated with horse-dander extract, — 26 doses in a period of about 6 months, — and improved. Twenty-seven years later, this man, aged 41, has had no further asthma of any kind; he says that he lives in a house full of cats and has ridden horseback on several occasions without any trouble. He has head colds on occasion, and the mucus rattles a little, but he has no real wheeze. It is interesting that skin tests, repeated at age 40, showed strong reactions to all the animal danders to be still present. He has no symptoms, but whether one could claim a real cure is doubtful.

What cured these patients? The right-hand column in Table 2 summarizes the treatment given. Specific treatment with extract of animal danders from dogs and sometimes cats and horses was given to 6 patients, and bacterial vaccines were given to 5 others. In 8 cases, however, no active treatment of any kind was administered. The family was advised to dispose of the animals and to improve the general care of the child. The time lag between the age at first visit and the age at "cure" shows that in only a few cases was the treatment effective at once. All too often the family was slow to eliminate the dog or cat, and our advice was not given with sufficient conviction and emphasis. All too often treatment with extracts or vaccines was tried first — and often it was successful, at least in part. Complete "cure" took time — too much time.

"Clinically relieved but still sensitive" describes a group of 55 cases. They are free of asthma and are physically well, but they recognize that contact with animals will still cause asthma. As will be discussed in a moment, it is important to note that new head colds do not produce asthma. This case is typical:

M. L. L., a girl of 9, had had asthma since age 5. Her family had several saddle horses and dogs. In summer she had "hay fever" and in the winter she was rather better. Her nose was always stuffy, but it was more stuffy whenever she went to the stables or rode horseback. On visits away from home she was much better, and when she later went to boarding school all symptoms cleared, only to recur during vacations at home. Skin tests showed large reactions to the common pollens and the animal danders. At ages 16, 17 and 18, treatment with extracts of grass pollens, ragweed and horse dander helped a little — local reactions were of good size. At age 21 she married and soon bore 2 children. Her summer hay fever had subsided; she now had no contact with horses, and she had no symptoms except that once, when she went to a horse show, her nose ran and her chest felt tight. At age 41 the story is exactly the same. She is still horse-sensitive, She becomes tightened up after half an hour at horse shows. Otherwise she is in perfect health.

Table 2. *Animal Asthma — Cured.*

Case No.	Patient	Sex	Age at Onset	Age at First Visit	Age at "Cure"	Age at Follow-Up	Eczema	Treatment
1	M. D. H.	F	4 wk.	6	13	25	0	Horsehair extract, 4 doses
2	N. C.	F	1 yr.	8	20	31	0	Vaccines
3	J. H., Jr.	M	1 yr.	6	14	26	0	Avoid animals
4	M. L.	F	1½ yr.	3½	15	25	0	Vaccines; avoid animals
5	H. S., Jr.	M	2 yr.	4	14	22	0	Horse hair extract
6	P. S.	F	2 yr.	5	8	20	Infantile	Horsehair; dispose of dogs
7	E. K.	F	2 yr.	13	20	35	0	Horsehair extract
8	B. L.	F	2 yr.	4	5	20	0	Dispose of cat
9	J. R. H., Jr.	M	3 yr.	5	17	30	Infantile	Avoid animals
10	R. H. C.	M	4 yr.	6	23	29	0	"Outgrown"
11	D. M., Jr.	M	4 yr.	7	14	22	Infantile	Dog-hair extract, 28 doses
12	M. D.	F	4 yr.	10	14	33	0	Dispose of cat
13	H. M. W., Jr.	M	4 yr.	9	10	29	0	Hygiene — avoid animals
14	G. L.	M	5 yr.	7	13	27	0	Vaccine; omit wheat; avoid animals
15	W. H. B., Jr.	M	6 yr.	11	13	26	Infantile	Hygiene; dispose of cats
16	D. S.	M	6 yr.	10	13	23	0	Cat hair, horsehair — 18 doses
17	B. E.	F	7 yr.	11	21	37	0	Vaccine; hygiene; avoid animals
18	W. K., Jr.	M	9 yr.	13	28	41	0	Avoid animals
19	J. H.	M	9 yr.	10	12	33	0	Avoid animals
Averages			3.7	7.7	15.2	26.4		

Of these 55 cases, the cat was the cause in 19 cases, the horse in 7 and the dog in 4, but in the other 25 cases no one could say which animal had produced the symptoms. Whether on a farm or in the suburbs, the family had a dog, as well as a cat, and perhaps a horse. In most cases skin tests showed positive reactions to each of the animal danders at the same time. The average figures in this special group showed: Age of onset at 5.2 years; first visit at 8.8 years; relief of asthma at 15.1 years; and follow-up at 28.7 years. If the asthma was caused by contact with animals, why did not relief, or "cure," occur until some six years after the first visit? It is true that in 9 of the cases the animal was eliminated and the house was cleaned, whereupon the child stopped his wheezing at once. In most cases, however, the family pet was important, and the physician was not sufficiently convinced of the cause to insist that

changes be made. Specific treatment with dander extracts was given to 14 of the 55 patients, and the time between start of treatment and relief of symptoms was shorter in this treated group — an average of 3.4 years instead of 6 years. However, even with treatment the sensitiveness did not clear; it was merely modified in degree.

Mild symptoms still occur in 13 of the "animal-asthma" patients. Each of them is still clinically sensitive to animals, and the skin tests repeated in 2 still show large reactions. The present symptoms, however, are not due always to animal contacts. The patient tries to avoid animals. The typical complaint is that asthma occurs with head colds. In these cases, especially, skin tests show positive

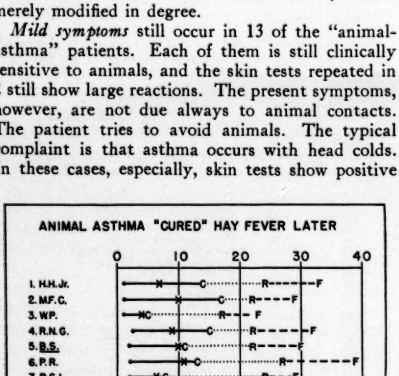

FIGURE 1. *Children "Cured" of Animal Asthma Who Later Developed Hay Fever.*

Each line represents the progress of a patient and begins at the age of onset. Solid lines represent persistent symptoms; dashes are attacks; the dotted lines represent clearance of asthma. X = Age at time of first visit; C = "Cure" of asthma (or clearance); R = Recurrence of symptoms, whether of asthma or of hay fever; F = Follow-up; underlined initials = Girls.

reactions to other substances than the animal danders; the cause of trouble was mixed and multiple.

"Asthmatic bronchitis" is a useful term that fits here. Its two parts are descriptive. Colds in asthmatic children cause attacks of wheezing because, in theory, they lower the threshold to make a slight degree of allergy become clinically manifest. If a wheeze occurs with colds, it means that the child is still in contact with some foreign dust substance. If the patient with animal asthma is out of contact with animals and does not wheeze with his colds, one can assume that he is sensitive to animals alone; but if he does wheeze and is away from animals, then the cause is multiple; he is sensitive to other things at the same time.

Seven patients who originally had animal asthma still suffer from it. Their asthma began at an average age of 2.5 years, they were seen at average age 8.6 and they are now average age 32.8, ranging in age from twenty-eight to forty-seven. "Frequent but mild attacks," "severe only with colds," "shots for dust and pollens throughout the year" "always carries pills," "attacks from contact with dogs" and "takes adrenalin" are typical replies.

The oldest patient (B. B. now aged 47) has been followed since the age of 6. In certain environments he is better, but he still wheezes with every cold. He has hay fever in the ragweed season. He has had all types of treatment; he is still sensitive to animals. In another city he was given ACTH (two shots) but with no effect. However, he has never been hospitalized for his asthma.

An interesting group comprises those 17 patients who were originally sensitive to animals but improved greatly, lost their early asthma and later suffered a recurrence of allergic symptoms — usually in the form of hay fever. One or two were treated with dander extracts, but in most cases the early advice was to get rid of the cat, dog or horse — after which the patient was free of asthma for some years. Later, however, those patients developed hay fever, mostly in mild degree, and not severe enough for treatment with extracts.

Figure 1 shows these cases in graphic form. It raises a good question: Was hay fever a new development? Or was the child slightly sensitive to pollen all the time but not sensitive enough for symptoms to result? This latter seems the best interpretation. Cooke[8] has discussed certain positive skin tests as indicating "potential" causes of asthma; these cases seem to fit in that category. On the other hand, in Cases 4 and 12 the original skin tests showed no skin reaction to tests with

TABLE 3. *The Ages in the Progress of the 138 "Cured" Cases.*

CLASSIFICATION	NUMBERS		AGES			
	TOTAL	BOYS	ONSET	1ST VISIT	CURE	FOLLOW-UP
Animals	19	10	3.8	6.0	13.3	26.7
Foods	16	10	2.0	5.4	14.6	30.5
Pollen	4	3	4.3	8.0	17.0±	29.3
Mixed and unidentified	50	30	4.7	8.2	15.3	30.3
Negative skin tests	49	32	3.6	6.8	14.4	27.8
Totals	138	85				
Averages			3.8	7.0	14.7	28.9

timothy or ragweed-pollen extract, even by the intradermal method, and one can say that in them the development of pollen sensitiveness was new.

Case 16 in Figure 1 is unusual and interesting:

As a boy, R. H. C. had typical cat and horse asthma, which cleared at age 18. He studied chemistry and at age 24 had an industrial job in which he had to work with chlorinated hydrocarbons. Contact with the chemicals led to asthma, but he bore with it for about six years. At age 30, however, he quit the job and moved to Colorado, where he became well again. He has been essentially free of asthma ever since.

The capacity to develop sensitiveness was retained by this man — and that is the essential lesion in all cases.

Later, in discussing the "Mixed and Unidentified" group, the recurrence of asthma itself will be demonstrated.

Asthma from Foods

Table 1 shows 36 children (24 boys and 12 girls) as having asthma from foods. They comprise 8.1 per cent of the whole. As in the animal group, the food cases can be divided according to end results. In 16 cases the patients were "cured" by eliminating the offending food substance; Table 3 shows the ages in their progress. It is important to note that the age of onset was early, 14 of the 16 patients developing their symptoms on or before age three. The average age at onset was 2.0 years. The first visit was at average 5.4 years, "cure" occurred at 14.6 years and the follow-up was at 30.5 years. The foods responsible were egg in 10 of the 16 cases, fish in 4 cases, milk in 1 and wheat in 1. In no case, however, did these particular foods represent the only positive skin test obtained. Other foods reacted also, and in some cases the patient was sensitive to animal danders, feathers or dusts at the same time. The diagnosis was made first because the mother recognized that "eggs will upset him" or "fish makes her lips swell" and secondly because elimination of the particular item brought relief of symptoms. It is interesting that all but 3 of the cases had atopic eczema and 4 of them had attacks of urticaria at times, particularly after the offending food was eaten. In this "cured" group the patients have overcome their early sensitiveness and now are able to eat the offending food without difficulty. Three of them deserve special attention:

L. S. was seen at age 3. The history revealed that any trace of cows' milk by mouth would cause an immediate reaction, with colicky abdominal pains, vomiting and prostration, simulating surgical shock. The skin test to cow's milk gave a large reaction. During her childhood she was fed on goat's milk and later on mare's milk, and she did well. At age 4 cow's milk was added in small amounts, — at first in drops, later in teaspoonfuls, — and gradually she was able to take larger quantities. At age 5 she was drinking three glasses of cow's milk a day, and at age 10 she was eating all foods and appeared to be a normal child. At age 19 she married; since then she has had no trouble with foods of any kind. Recently, however, since the age of 24, she has developed ragweed hay fever, but this has been brought under control.

W. S. J., a boy of 7, developed eczema at 5 months that lasted until age 2. As the eczema subsided, asthma developed in attacks, coming about three or four weeks apart, especially in winter. The food sensitiveness was interesting. After eating the smallest bit of fish his lips would swell, and presently a generalized urticaria would appear. Nuts would produce the same train of symptoms, as would eggs. Skin tests at age 7 showed enormous immediate wheal reactions to fish, nuts and eggs, as well as to wheat and peas, and finally to grasses and ragweed. As the boy grew older, his asthma attacks diminished in severity and frequency, and the food sensitiveness diminished also. In high school he was quite well, and at college he was even better. At age 21 he caught a virus pneumonia with jaundice afterward; from that time his asthma disappeared entirely and the clinical sensitiveness to foods disappeared also. At age 24 he is very well.

G. S. E., Jr., age 7, complained of frequent wheezing and cough, with rattling in his throat. His appetite was good and his digestion appeared normal. Skin tests showed strong reactions to wheat, with other tests negative. When this wheat was eliminated from his diet, there was an immediate improvement. The attacks of bronchitis, pharyngitis and wheezing disappeared. Treatment with small, increasing doses of white bread was advised; after this his tolerance for wheat improved. Two years later, at age 9, he was eating bread in normal quantity. Since then he is perfectly well. He is now aged 38.

"Foods — clinically cured" describes a group of 10 cases with histories and skin tests quite similar to the "cured" group. Again, the symptoms developed early, at average age 1.5 years. Eczema was present in all cases, with attacks of urticaria in 2. This group is different because the food sensitiveness has persisted into adult life; the follow-up is at average age 23.4, and one reads such comments as: "No asthma so long as he keeps away from milk"; "has outgrown her egg sensitiveness but is still sensitive to fish"; "eats everything except nuts and citrus fruits."

Other allergies have developed in food cases. In 6 additional children, the early symptoms depended largely on foods. Eczema and urticaria, or both, occurred in all, and now at average age 28.1 the food sensitiveness has cleared away, but, as in other groups, a new manifestation of allergy, hay fever, has developed. However, it is not bad enough for treatment except in one case.

Four cases in the food group are still sensitive but not especially to foods, although they report that they still have asthma, eczema or urticaria if they eat the offending substance. Three of the 4 are sensitive to other factors, especially the pollens. All 4 still have asthma of moderately severe grade.

Positive skin tests to foods, especially egg, wheat, milk, nuts and fish, have been observed in many other cases, but this series of 36 cases includes all in the total of 449 cases in which the food sensitiveness could be demonstrated as having anything more than casual interest so far as the asthma was concerned.

Pollen Asthma

Pollen asthma is not common in children. Pollen hay fever is common, as will be shown presently. For some reason, small children do not often wheeze with their hay fever.

In this series of 21 cases (18 boys and 3 girls), the average ages were: Onset 4.3 years; first visit 8.0 years; and follow-up at 29.3 years. Four of the cases are "cured"; they have had no hay fever, asthma or eczema and take no treatment. They "outgrew" their trouble at about age 17. (The letters are not too accurate.)

Twelve other patients are "almost cured." They still have some hay fever, but it is never troublesome, and no treatment is needed to control them.

Only 5 patients in this series have any important symptoms. Three are still under treatment with pollen extracts; 1 has good control; the other 2 still have difficulty. Their letters describe "sinusitis" in addition to the hay fever. Two other patients must take antihistamine pills during the pollen season; with them, they get by well.

These figures emphasize that pollen asthma — with positive skin tests and occurring only during the pollen season — is uncommon in children. In contrast to asthma, hay fever in children is *not* uncommon, and since the distinction between symptoms in the chest and symptoms in the nose is not always too clear, it becomes useful to insert here an extra report about 86 children with hay fever who were seen before the age of 13 — the figures not to be included in the statistics on asthma.

Hay fever was observed in 86 children. Only 2 of the 86 are "cured" — 2 boys who are now aged twenty-five and thirty-three.

A. H. S., Jr., was seen at age 5. Since age 2 he had had hay fever each summer from May to frost. Skin tests showed small reactions to both grasses and ragweed. He was considered too young for pollen treatment. "His hay fever grew less each year, and by age 12 he was over it."

W. V. P., Jr., age 11, had hay fever each June, with large positive skin tests to all grasses. He was treated for two years with timothy and orchard-grass extracts, "so successfully that he has had no trouble since."

The other 84 children still have hay fever. Half of them (42 cases) still have some "stuffinositis" at times in summer, but it is not severe enough for active treatment; a few doses of the antihistaminic drugs are all that is necessary to keep them comfortable. Their present ages range from twenty-five to forty-two and average 32.4 years. Eleven other patients are still under treatment by various doctors. Three patients have died; 2 were killed during World War II and 1 died of severe hypertension with a stroke at age forty-three.

This leaves 28 patients who still have hay fever. In 3, the hay fever is severe — evidently from the lack of treatment. In 25 others, the trouble depends on new symptoms of hypersensitiveness. Asthma has developed in the hay-fever season in 13 cases and out of the season in 7 other cases. Infantile eczema has reappeared in 4 cases and is troublesome in each one, the 4 patients being now within a year or two of age thirty. One other patient is interesting because she developed ragweed hay fever at age 5 and cat asthma at age 10. Now, at age thirty-seven she is well, — she has no trouble from ragweed or any other pollen, — but she still sneezes and "stuffs up" in the presence of cats. She has had no treatment in the thirteen years since age twenty-four.

Sensitiveness to pollens is evidently different from the sensitiveness to animals, foods or such dusts as kapok, feathers or orris powder. Whereas 16.6 per cent of the animal cases and 44.0 per cent of the food cases have lost their early clinical sensitiveness, it is surprising to find that the sensitiveness to pollen persists, except in 5.6 per cent of the cases of pollen asthma and hay fever combined. Meanwhile, one knows of friends who were said to have had hay fever in their childhood but who "outgrew" it before or during their college days. If so, it is curious that the figures in this study do not agree with those stories. Was the hay fever in these friends too mild to warrant treatment? None of them have mentioned asthma as a part of the process, and now we learn that pollen asthma is unusual in children. Could specific treatment make the immune process more persistent? One of the 2 boys "cured" of hay fever had preseasonal treatment with pollen extracts for two years, and 1 of the 4 cured pollen-asthmatic patients had extensive treatment; all but 7 of the 42 mild cases had treatment. One would like to control the matter by watching the results in a number of proved cases in which treatment was withheld, but in this modern day such controls are difficult to produce. Before 1906, however, there were plenty of untreated cases. Here is what two authorities, both good observers with wide experience, wrote about the prognosis in hay fever:

In 1872 Wyman[9] wrote:

> It [hay fever] varies somewhat in severity in successive years. In early life the first attacks are often as severe as any subsequent ones: in other instances they gradually increase in severity as age advances: in a few it has pretty steadily diminished and even become bearable — *but it has not disappeared.* [Author's italics.] It may be assumed that the predisposition once developed with a full attack will continue in a greater or less degree through life.

In 1906 Wolff-Eisner[10] wrote:

> The hay fever which once affects the individual does not leave him during his life — reports of cure of hay fever are of single cases and quite insecure, since the nature of the disease was not proved.

Evidently treatment is not harmful.

In the other groups of cases some stress has been laid on the development of other and new manifestations of allergy. It is the pollens to which this new sensitiveness has been directed in most of the cases, and this pollen sensitiveness tends to persist; it does not tend to clear, as does sensitiveness to animals or dusts. Something is peculiar about pollen. It has an effect on the body that is different from the effect of foreign substances of other types. A possible reason for this may be that the pollens return each year and the patient cannot escape from them as he can escape from cats, dogs or kapok. We have observed, however, that most of the men who came back after two years in the South Pacific resumed their hay fever quite as usual. A better idea concerns the pollen itself. It is a good *allergen*, in the sense that it induces sensitiveness easily. On the other hand, it is not a good *antigen*. The active principle in pollen is not a protein with a very large molecule. Antibodies are difficult to demonstrate in hay fever, and one wonders whether the persistence of sensitiveness may not depend on the fact that immunity to pollen does not begin as promptly or develop as completely as immunity to other more protein-like substances. The figures here lend a little support to that idea.

Mixed and Unidentified

"Mixed and unidentified" is the only title that can be applied to the largest group. Here is a total of 199 cases (134 boys and 65 girls) whose early

asthma was obviously of extrinsic origin. In most of them the attacks were related to changes in environment. Sometimes there was a history of food reactions, but it was not possible to relate these accurately with the development of asthmatic symptoms. Skin tests showed a variety of positive reactions to animal danders, to the dusts of feathers, kapok or orris and at times to food. The list of cases is not presented here. The ages are comparable to the more typical animal and food cases.

Fifty of the 199 "mixed and unidentified" cases, or 25 per cent, are now cured, perhaps in a final sense. These "cured" children developed their asthma at the average age of 4.7 years, and they were seen at average age 8.2. They were "cured" at average age 15.3, the method of cure being varied and sometimes indefinite. Follow-up was at average age 30.3.

R. R. had eczema in infancy and asthma beginning at age 2. At age 6, skin tests showed reactions positive to pollens, with other dusts and the common foods negative. He was better, rather than worse, in summer. When a kapok mattress was found and removed, the asthma cleared. At age 25 he is well.

M. K. at age 8 had skin tests positive to wheat, eggs, tomatoes and nuts, as well as to dog hair and orris powder. She had a stuffy nose, and when "the antra were scraped" she was better. At age 12, however, asthma recurred, culminating in a bronchopneumonia with shadows in the chest x-ray film. After that she improved rapidly and gained weight; at age 35 she reports that she has been entirely well and free of asthma ever since age 12.

Shall we say, first, that, like R. R., M. K. had been sensitive to some dust substance that was unrecognized but was finally eliminated by chance? Or shall we say that she was not allergic to dusts or foods but suffered from a chronic upper-respiratory infection that finally subsided? Or shall we say that the operation at age eight and the pneumonia at age twelve were both insults to the body that produced a nonspecific reaction that "changed the resistance"? Or shall we say that at age twelve the girl matured and was due to get well anyway?

The next patient had a physical defect that at first seemed serious:

E. W. R., a boy aged 11, had had asthma in attacks, with colds, since age 2. The attacks had come at all seasons, in summer as well as in winter. At age 11 he was a frail, round-shouldered, barrel-chested boy with cyanosis of the lips and clubbing of the fingers. Skin tests showed slight reactions to timothy, ragweed and orris-powder extract. At age 17 he was better, but the barrel chest and cyanosis were still evident, and his red-cell count was 7,900,000. The polycythemia confirmed his emphysema. Now, at age 40, he is very well. He has had no asthma for 20 years; — "I just got better and better, and finally it left me."

How can one say that either pollen or orris powder was causing his trouble? Was he clinically sensitive to some other substance that did not show on skin test, or, in view of his barrel chest and cyanosis, shall we say that some chronic infection was important and that it passed off as he grew older? The cause of trouble was unidentified. Incidentally, this boy is the only patient in this series who had such a chest deformity. More recently, one or two others have been seen; they have done well also.

The 50 cured patients follow patterns similar to these three. In most of them, the circumstantial evidence pointed to allergy. Skin tests showed various positive reactions; then, more importantly, the symptoms varied with changes in environment. The bed was changed, and the subsequent striking improvement showed that the mattress or the pillow was at fault. The family moved to another area or perhaps only to another house on the same street, and the child improved. Such experiences are always important. Skin tests to pollens were common, yet none of these cases were worse in the pollen season — in fact, most of them were better in summer. Treatment with vaccines or dust extracts had been given to some but never with definite and clear-cut results. Those patients who lost their asthma promptly, — who did very well, — were those who by direction or chance eliminated the cause of trouble.

Personal visits of the physician or the social worker to the home to inspect the rooms, the furniture and the bedding were often rewarded by the discovery of kapok (silk floss) in cushions downstairs or, more rarely, in mattresses and pillows upstairs; in several patients the cure began when this kapok was taken away — sometimes confiscated by the doctor at the time. We have learned that house visits can pay dividends.

There are two other large groups of patients in the Mixed and Unidentified classification who are essentially free of asthma but are not really "cured."

"Clinically cured" describes the first group of 22 patients. Since they know now that exposure to certain environments or substances will cause trouble, they have learned to avoid them. These two cases are typical:

J. B. H., Jr., was well up to age 8 except for an early sensitiveness to eggs. At age 12, skin tests were positive to animal danders and pollens and wheat, oats and beans. The egg test was negative. His summer hay fever was the chief complaint, but also he would sniffle when playing with his dog. In spite of the history treatment with grass pollens at age 13 did not help him, but later on, at age 21, treatment with dog and horse extracts helped him greatly; after that the winter asthma disappeared. The summer hay fever improved also.

At age 41 he writes: "If I expose myself to animals or to the dry hay in a barn, I sneeze and wheeze a little."

E. N., with wheezy colds beginning at age 3, was seen at age 9; skin tests showed good reactions to ragweed, cat hair and feathers. Treatment with ragweed and vaccine helped a little, and in the second year it helped more. At age 16 she was perfectly well. At age 23 she had a secretarial job and felt perfectly well, except that whenever she went to her home in the country she would wheeze. Skin tests were still positive to ragweed and to wheat. Five years later, at age 28, she still had no trouble unless she went home.

The group includes 5 cases in which foods played a role. In each case the main story was that asthma still occurred in special localities and improved after moving away, but the patient reported that his childhood sensitiveness to eggs, milk, fish or nuts still persisted: he could eat everything except the specific items.

K. H., Jr., age 7, was skin sensitive to various dusts but not to foods. His mother said, however, that eggs and nuts would make him vomit. At age 10 he had moved to Virginia, where he was much better. At age 23 he seldom had asthma. There was still a little eczema on the elbows, and he was still allergic to nuts. He had learned about his sensitiveness and was perfectly well so long as he avoided the offending articles. He was living in an environment that agreed with him.

Other allergies have developed in these mixed and unidentified cases. There is a large group of 60 patients whose histories and skin tests are entirely comparable to those described in the preceding section. Their early asthma is under control; sometimes it has cleared entirely, but now the trouble is hay fever, which is due, in 20 cases, to the ragweed in August and September and in 6 cases to the grass pollens in June. In 7 cases the hay fever was due to both grasses and ragweed, and in 16 the dates of hay fever are not stated. The age at which the hay

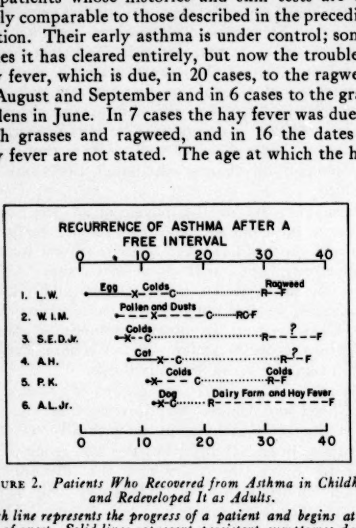

FIGURE 2. *Patients Who Recovered from Asthma in Childhood and Redeveloped It as Adults.*

Each line represents the progress of a patient and begins at the age of onset. Solid lines represent persistent symptoms; dashes are attacks; the dotted lines represent clearance of asthma. X = Age at time of the first visit; C = "Cure" of asthma (or clearance); R = Recurrence of symptoms, whether of asthma or of hay fever; F = Follow-up; underlined initials = Girls.

fever appeared is usually not stated in the follow-up report, but since the present age averages 28.2 years and the relief of asthma occurred at average 15.6 years, one can assume that the hay fever began in the early twenties, as is common.

Eczema was a troublesome complication of the asthma in 6 cases. It began in infancy, improved somewhat when the asthma was severe and then recurred as the asthma was relieved.

G. G. had had eczema in infancy and wheezy colds all his life. At age 10, skin tests showed positive reactions to horse dander, ragweed and grasses; food tests were negative. He was treated with vaccines and his colds improved; at age 11 he was better, and after age 14 he was well. At age 16, however, the eczema recurred, and after that it persisted with ups and downs up to the time of his follow-up at age 38. The asthma has never recurred.

The case of H. C. is a little different. She, too, had wheezy colds in childhood but no eczema. She was clinically sensitive to horses, and skin tests at age 5 showed good reactions to horse dander, with smaller reactions to cat hair and orris. Treatment with horse-dander extract did not help her — for the reason (in retrospect) that horses were not, in fact, the actual cause of her symptoms. Later on, at age 12, vaccines helped her colds so that "she grew up well and strong." When she married and bore children, eczema developed with each pregnancy and asthma recurred also. At age 33 she reports her condition as good, although she is still under treatment.

A. MacC., a thin, frail boy of 9, was seen in August for severe asthma that had developed in the preceding May. Skin tests were negative at first, and in spite of general treatment asthma continued until age 12, when pneumonia developed in May. After this severe illness, all asthma subsided. At age 19 the boy was well. During World War II he was aged 37. In Manila he developed a severe eczematoid dermatitis, for which 97 shots of penicillin were injected. After the last shot, giant hives broke out; he suffered vomiting and collapse and was very ill for 8 days. Asthma suddenly came in severe form. It lasted 6 days and then passed as suddenly as it had come. In the 6 years since then (up to age 43) asthma had not recurred.

E. S. R., Jr., with asthmatic bronchitis in childhood, developed, at age 16, a sensitivity to mercury compounds, resulting in a severe contact dermatitis. At age 25 he had a severe serum-sickness-like reaction to penicillin.

Asthma can recur after a long period of remission — and the fact has several interesting implications. Figure 2 represents 6 patients who recovered entirely from their childhood asthma, — between the ages of eleven and twenty-one, — and were then well for periods as long as fifteen years in 3 cases, twelve years in 1 case and five years in 2 others. The recurrence was around age thirty in 5 cases. The cause was different from the first episode in at least 2 of the cases. In one case the recurrence consisted of a single isolated attack of asthma that lasted only a few days. In the sixth case the recurrence was at age twenty-one, when the patient took up dairy farming.

The cases just reviewed bear out the concept that the mechanism in the genesis of asthma in childhood is allergy; it is the capacity of the individual to develop a sensitiveness to foreign substances in his environment. The disease may begin as an eczema due to food, then progress to an asthma due to animal danders and end with a hay fever due to ragweed. The changing manifestations are as interesting as the change in the direction of the sensitiveness.

Asthma continues. Not all the mixed and unidentified cases of asthma in children have cleared. There are 59 cases, or 30 per cent of the group, who still have asthma. They include 37 boys and 22 girls. In 26 of these cases the present asthma is mild. Ten patients have explained that a wheeze follows every new head cold. Five are still sensitive to animals or to the dusts of certain environments although the relation of the asthma to the particular foreign substance is not direct. Two other patients recognize that nervous tension can lead to a wheeze. In 9 others, however, no good theory to explain the present attacks is offered.

In 24 cases the asthma is really troublesome, and in 9 others the attacks in the past few years have been severe enough to require treatment in hospitals.

What is wrong with these 33 severe cases? How do they differ from the majority who have done well? The average ages are the same: onset at 3.6; first

visit at 7.7; and follow-up at 27.6. Skin tests were positive in all except 2, and these 2 are included here because the asthma was clearly related to changes in environment. One was much better away from home; the other had trouble at the seashore. Positive tests to foods were almost as common as positive tests to animals — 19 patients skin sensitive to foods as against 23 to animals. Seven of the 33 children were skin sensitive to animals, pollens and foods, especially to eggs, at the same time. Infantile eczema had been present in 11 cases; in 7 of them this eczema persisted into adult life. In the cured group of mixed and unidentified cases, infantile eczema had occurred in 13 of the 36 cases — about the same proportion.

More interesting, perhaps, was the occurrence of a stuffy nose with obstruction, sneezing and running in 10 of the 33 severe cases — which compares with only 4 among the 36 "cured" cases. Whether this increase of rhinitis was connected with the cause or with the result of the disease is not clear. Many of these particular patients were referred to us by nose-and-throat experts whom they had consulted. In no case was sinusitis reported, although nasal polyps were found in 1 patient aged nine. Large tonsils were found in 9 cases, and the tonsils had been removed in 9 others. One cannot say that the asthma was severe and persistent because of sinus infection, however well that idea might fit with the serious effects of sinusitis in the older patients with intrinsic asthma. The fact that paranasal sinusitis is almost nonexistent in the asthma of children, even when these "children" grow to the age of 27.6 years, is one of the interesting points revealed in this study.

This completes the discussion of the 370 children with asthma who were seen before the age of thirteen and who showed positive skin tests. The remainder of this paper will deal with the 79 test-negative cases and will then discuss all the 449 cases in the "young" group. It will also present and discuss those 239 older patients whose asthma likewise began in childhood but who were not seen until after the age of thirteen.

(To be concluded)

References

1. Rackemann, F. M. Other factors besides allergy in asthma. *J. A. M. A.* 142:534-538, 1950.
2. Rackemann, F. M. Studies in asthma: clinical survey of 1074 patients with asthma followed for two years. *J. Lab. & Clin. Med.* 12:1185-1197, 1927.
3. Unger, L. Bronchial asthma: results of treatment in 207 patients under observation for period varying from one to thirteen years. *J. Allergy* 7:364-371, 1936.
4. Unger, L., Levy, H. A., Unger, A. H., and Eisele, I. B. Scientific exhibit: diagnosis and treatment of bronchial asthma. *Postgrad. Med.* 4:63-69, 1948.
5. Flensborg, E. W. Prognosis for bronchial asthma arisen in infancy after nonspecific treatment hitherto applied. *Acta pædiat.* 33: 4, 1945.
6. Williams, E. O., and Williams, G. E. O. Natural history of asthma: review of 300 cases. *Brit. M. J.* 2:897-900, 1949.
7. Dublin, L. I., and Marks, H. H. Statistics of bronchial asthma. In Derbes, V., and Engelhardt, H. *The Treatment of Bronchial Asthma.* 466 pp. Philadelphia: J. B. Lippincott Company, 1946.
8. Cooke, R. A., et al. *Allergy in Theory and Practice.* 572 pp. Philadelphia: W. B. Saunders Company, 1947.
9. Wyman, M. *Autumnal Catarrh (Hay Fever).* 173 pp. Cambridge: Hurd & Houghton, 1872.
10. Wolff-Eisner, A. *Das Heufieber, sein Wesen und seine Behandlung.* 139 pp. München: J. F. Lehmanns, 1906.

MEDICAL INTELLIGENCE

SPINAL-CORD INVOLVEMENT BY SCHISTOSOMIASIS MANSONI*

GORDON L. ROSS, M.D.,† JOHN W. NORCROSS, M.D.,‡ AND GILBERT HORRAX, M.D.§

BOSTON

PATIENTS suffering from schistosomiasis have rarely been found on the North American continent. However, the large number of infestations known to have occurred in members of the Armed Forces stationed in various parts of the world has increased the potential incidence of this parasitic disease. This case is an example of an unusual ectopic manifestation of schistosomiasis mansoni.

*From the Departments of Neurosurgery and Internal Medicine, Lahey Clinic.

†Formerly, fellow in internal medicine, Lahey Clinic.

‡Staff member, Department of Internal Medicine, Lahey Clinic.

§Staff member, Department of Neurosurgery, Lahey Clinic.

Case Report

A 16-year-old boy from Venezuela was referred to the clinic by his physician in Caracas and was admitted to the New England Baptist Hospital in February, 1951. He had been well until July, 1950, when weakness of the right leg, loss of temperature and touch sensation in the left leg, an area of anesthesia on the right anterior chest wall and slight difficulty in voiding became evident. These symptoms became progressively worse, and in November, 1950, an examination by his physician showed a sensory level at the 1st and 2nd lumbar segments on the left. There was some spasticity of the right leg, with diminished muscle tone and strength. All reflexes were hyperactive, and the Babinski reflex was positive bilaterally together with patellar and ankle clonus. Pain, touch and temperature sensations were diminished in the left leg. A lumbar puncture, performed in Venezuela, revealed an initial pressure of 120 to 150 mm. of water, with normal dynamics, 2 to 3 lymphocytes, 0.52 per cent total protein, 0.75 per cent glucose and a + reaction to the Pandy test. A myelogram showed an inconstant defect from the 12th thoracic to the 1st lumbar vertebra and a similar defect at times from the 1st to the 2nd lumbar vertebra. Laminectomy from the 12th thoracic to the 2nd lumbar vertebra was performed on December 4, 1950. A catheter inserted into the canal revealed no obstruction, and pathologic change was not found. Postoperatively, the patient's condition improved so greatly that by the end of December he was able to dance. In the early part of January, 1951, the symptoms reappeared and progressed; he was then referred to this clinic.

The patient's past history included a tapeworm infestation of many years' duration, with apparent cure in June, 1950. A tonsillectomy had been performed in July, 1950, after the onset of the present illness.

The general physical examination on admission was normal. Neurologic examination showed diminished sensation on the left side below the level of the 4th to the 5th thoracic segment, motor weakness in the right leg, with slight atrophy; bilateral hyperreflexia, with the right greater than the left; patellar and ankle clonus on the right; and bilateral positive Babinski reflexes. The cranial nerves were intact.

On admission, routine urinalysis and a blood Hinton test were negative; the hematologic report was within the normal range except for an eosinophilia of 8 per cent. Roentgenograms of the cervical and thoracic spine were normal except

FIGURE 1. *Pantopaque Myelogram, Showing the Oil Streaming Out on Either Side of the Fusiform Enlargement of the Spinal Cord Between the Fourth, Fifth and Sixth Thoracic Vertebras.*

for the bony loss due to the previous laminectomy in the region of the 12th thoracic to the 1st lumbar vertebra.

A spinogram showed the Pantopaque to flow from the cul-de-sac to the upper cervical level, but there appeared to be an intramedullary defect extending from the 4th to the 6th thoracic intervertebral spaces, impeding the Pantopaque as it flowed cephalad and caudad (Fig. 1). This was considered compatible with an intramedullary tumor.

On February 19, 1951, a complete laminectomy from the 3rd to the 7th thoracic vertebra with intradural exploration was performed; this revealed a fusiform swelling of the cord 4 to 5 cm. long from the 4th to the 6th thoracic level. A median incision was made in the dorsal surface of the cord; this disclosed abnormal grayish friable intramedullary tissue that was thought to be some form of glioma (Fig. 2). Some fragments of this tissue were excised for pathological study. The postoperative convalescence was uneventful, with no immediate neurologic change.

The pathologist reported the tissue to show a granulomatous and foreign-body giant-cell reaction of undetermined etiology. Further study of serial sections of the biopsy specimen revealed ova of *Schistosoma mansoni* (Fig. 3). Ova of *Ascaris lumbricoides* were found on repeated examinations of the stool. Liver-function tests were normal. Hematologic studies were within normal range, except for an eosinophilia of as high as 30 per cent.

Biopsy specimens of the rectal mucosa were taken at 8, 10, 12 and 22 cm. from the anal orifice. A granulomatous lesion containing the ova of *S. mansoni* was found in the specimen taken at the 22-cm. level. Approximately 6 years before the onset of the present illness, the patient had once gone swimming in lake water with a cousin in whom the diagnosis of schistosomiasis was later made. Symptoms suggestive of this disease had never developed in the patient and were not disclosed by a complete medical examination.

Treatment of our patient consisted of the intramuscular injection of trivalent organic antimony compound (Fuadin); 1.5 cc. was given on the first day and 3.5 cc. 2 days later in order to test for any unusual sensitivity to the drug. Thereafter, 5 cc. was injected every other day until a total of 40 cc. had been given.

Discussion

The fresh-water snail of the genus Planorbis is the intermediate host of *Schistosoma mansoni*.[1] Experimental attempts to infect species of Ameri-

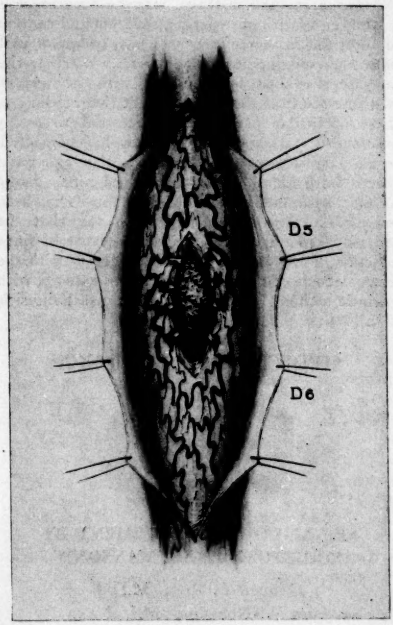

FIGURE 2. *Fusiform Expansion of Spinal Cord Seen at Operation.*
Incision through dorsal aspect of cord discloses the lesion from which the biopsy specimen was taken.

can planorbidae have generally failed. However, in 1945 a species of Tropicorbis from Louisiana was found to be capable of serving as an intermediate host. It is still true, however, that an endemic focus does not exist in the United States.[2, 3]

The diagnosis of schistosomiasis is made by the discovery of the specific ova in the feces, by certain serologic tests and by the presence of the ova or the

adult parasite in the biopsy specimen.[4] The lesions are usually primary in site, involving the alimentary canal or its appendages. Ectopic lesions, that is, specific local reactions to worms or their eggs outside of the portacaval circulation, also occur. The first ectopic lesion due to *S. mansoni* involving the spinal cord was reported in 1930[5]; Faust[6] has summarized the cases subsequently recorded.

The adult *Schistosoma mansoni* enters the body through the skin; it lives primarily in the venules of the inferior mesenteric vein but may be found in the radicles of the superior mesenteric vein or intrahepatically in the portal venules. The parasite is found less frequently in the hemorrhoidal plexuses and rarely is carried by the internal iliac vein, inferior vena cava and the right side of the heart into the pulmonary arterioles. Although several theories have been formulated to account for ectopic lesions, the most plausible explanation appears to be the fact that the vertebral venous system provides a natural valveless intercommunicating channel from the portal and caval veins to all parts of the body. Shortly after oviposition, the eggs escape through the vessel wall and infiltrate into the tissues by discharging through the eggshell an irritating digestive ferment that extends in a ray-like pattern into the surrounding area. A pseudotubercle is formed by the reaction of the tissue to this irritant.[6]

Ectopic lesions may occur years after intestinal symptoms have disappeared, or they may develop without any previous symptoms. Furthermore, live adult *Schistosoma mansoni* have been discovered as long as twenty-six years after known infection and with no possibility of reinfection.[7]

Our patient's home is in Caracas, which is one of the most heavily infested endemic areas in Venezuela.[8] His case is of interest because of its unusual features. The presenting symptoms referred specifically to the ectopic lesion, and prior history was not suggestive of primary lesions. The interval between probable infestation and the appearance of symptoms was six years, during which time the patient was in apparent good health. Our primary diagnosis was made because ova of *S. mansoni* and their surrounding pseudotubercles were found in a biopsy specimen of the ectopic lesion. The diagnosis was confirmed by means of a biopsy of the rectal mucosa that contained the ova and typical lesion. The medication selected for treatment was Fuadin rather than intravenously given tartar emetic because of the smaller chance of untoward reaction and intoxication and because of the reported cure rate of schistosomiasis mansoni.[4] It is important that patients with schistosomiasis receive adequate chemotherapy. This applies particularly to those cases in which there are ectopic lesions, since further ectopic complications can occur if adequate measures are not instituted.[9] The patient returned to his home; further studies, including examinations of feces and biopsy specimens of rectal mucosa, will be carried out in two to three months. If these tests are positive he will receive further treatment. Thereafter he will be watched carefully and particular care will be taken to avoid reinfestation.

So far as we know, this is the first case demonstrating this particular ectopic lesion to be reported in North America, although there have been similar cases in Brazil and Venezuela.[10] This report, therefore, should serve as a reminder that ectopic lesions do occur and should be considered in the differential diagnosis of problems presented by those who have resided in Schistosoma endemic areas.

FIGURE 3. *Photomicrograph, Showing Ova of* Schistosoma mansoni, *with Typical Surrounding Pseudotubercle.*

SUMMARY

A case is presented of *Schistosoma mansoni* with an ectopic spinal-cord lesion as the presenting symptom complex. The diagnosis was made by biopsy of this lesion. Evidence of gastrointestinal involvement was found by biopsy of the rectal mucosa.

We are indebted to Dr. Donald L. Augustine, professor of tropical medicine at Harvard Medical School, for his suggestions and diagnostic assistance in the study of this case.

REFERENCES

1. *Stitt's Diagnosis, Presentation and Treatment of Tropical Diseases.* Edited by R. P. Strong. Sixth edition. Vol. 2. 1747 pp. Philadelphia: The Blakiston Company, 1942. P. 1417.
2. Hayward, W. G. Schistosomiasis. *New York State J. Med.* 48:796-798, 1948.

3. Cram, E. B., and Files, V. S. Laboratory studies on snail host of *Schistosoma mansoni*. *Am. J. Trop. Med.* **26**:715-720, 1946.
4. *Principles of Internal Medicine*. Edited by T. R. Harrison et al. 1590 pp. Philadelphia: The Blakiston Company, 1950. P. 1137.
5. Müller and Stender. Cited by Ruiz Rodriguez.[9]
6. Faust, E. C. Inquiry into ectopic lesions in schistosomiasis. *Am. J. Trop. Med.* **28**:175-199, 1948.
7. Wallerstein, R. S. Longevity of *Schistosoma mansoni*: observations based on case. *Am. J. Trop. Med.* **29**:717-722, 1949.
8. Cram, E. B. Present status and possible spread of *Schistosoma mansoni* in western hemisphere. *Kuba* **3**:82-84, 1947.
9. Ruiz Rodriguez, J. M. *La Schistosomiasis mansoni en Venezuela*. 224 pp. Caracas: Litografía del Comercio, 1943.
10. Kane, C. A., and Most, H. Schistosomiasis of central nervous system: experiences in World War II and review of literature. *Arch. Neurol. & Psychiat.* **59**:141-183, 1948.

MANAGEMENT OF DYSPNEA

FRANCIS W. PALFREY, M.D.*
BOSTON

MEASURES seemingly too simple to be described in textbooks sometimes give the patient more comfort than those theoretically more important. Thus, when a retired professor of surgery with increasing dyspnea on effort recently took pains to express to the author his gratitude for the following thoughts, described casually at a medical luncheon some weeks before, it may be well to give these thoughts wider expression.

Dyspnea, whether of cardiac origin or due to exertion by a normal person, was formerly described as resulting from the accumulation in the blood of carbon dioxide, formed by the combination of carbon and oxygen in muscular metabolism more rapidly than the cardiorespiratory mechanism could excrete it in the breath, a resulting excess of carbon dioxide in the blood stimulating the theoretical respiratory center. However, at present this theory is generally questioned, because of failure to demonstrate chemically any excess of carbon dioxide in the arterial blood. It is, however, so consistent with the clinical facts that it leads one to wonder whether, if we can conceive of a respiratory center more sensitive than our tests of blood chemistry indicate, it may not still be true. But, in any case, it is obvious that dyspnea is caused by, and is proportionate to, excessive muscular exertion for the individual's cardiorespiratory capacity.

Cardiac dyspnea, therefore, results from an imbalance between muscular exertion and deficient cardiorespiratory function.

In conventional treatment, most attention is commonly paid to improvement of the circulation by digitalis and the reduction of pulmonary edema by diuresis and salt restriction. In serious cases, muscular effort is minimized by rest in bed, with a back rest to lessen the effort of breathing, but when bed rest is not necessary less systematic attention is usually paid to muscular activity. Its regulation is commonly approximated by what the patient can do without conscious discomfort. But the conception of limiting the amount and the rate of muscular action deserves to be an equal consideration. And, of all muscular activity, walking is the most important to human satisfaction in life, so that conservation of the capacity to walk, as may be effected by application of this principle of retarding muscle metabolism, is commonly to the patient's advantage, as in the following illustration.

Many years ago I was consulted by an elderly bachelor who lived in an apartment at the foot of a hill and whose long-time habit it had been to dine and spend the evening at his club, which was only about a hundred yards away but up a distinct incline. Through the past year he had gradually become conscious of increasing shortness of breath in taking this walk, until of late he had had to stop once or twice on the way. It seemed to him absurd to have to take a cab for this short distance, but inability to go to his club would destroy a large part of his satisfaction in life. What could he do?

He was a man of average height, somewhat stooped from age, not overweight, with a heart moderately enlarged but regular in rhythm; the pulmonic second sound was slightly more accentuated than the aortic, and there was slight crepitus at both lung bases. The blood pressure was only slightly increased; the liver was not enlarged; and only slight edema of the ankles was evident. In the corridor of his apartment he walked with a slightly irregular, nervous gait but without notable increase in respiration. He was obviously a case of cardiac insufficiency, slight while at rest but with almost no reserve.

The presenting complaint of inability to climb a hill led me to think of my previous observation of the method of Swiss mountaineers. The Swiss guide starts his day on the level, walking with steps as regular as the ticking of a clock, about one hundred to the minute, and he maintains this rate and rhythm all day. But whereas these steps are of whatever length is natural to him when he is walking on the level, with each increase in grade he shortens them, still in the same rate and rhythm, until in steep climbing they may be only a few inches long. His American tourists at first climb far ahead and have to wait for him, but before long he is likely to have to wait for them. Thus by experience he has learned to keep his muscular effort and cardiorespiratory function well within balance.

I was able to teach my patient this method of progression, and for nearly two years, until he died of a cerebral accident, he was able to maintain his routine contentedly and was loud in his praises of the value of this training. In the many subsequent years a considerable number of other patients, including my surgical colleague already mentioned, have found the method advantageous. Some, with limited understanding, have attributed more benefit to it than to digitalis.

Thus I report it, in the hope that as a suppplement to other treatment it may be found to promote human contentment in the patients of other physicians.

*Consulting physician, Boston City Hospital.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Weekly Clinicopathological Exercises

FOUNDED BY RICHARD C. CABOT

BENJAMIN CASTLEMAN, M.D., *Editor*

VIRGINIA W. TOWNE, *Assistant Editor*

CASE 38211

PRESENTATION OF CASE

A sixty-year-old Albanian entered the hospital because of swelling of the right thigh.

Five months before admission the patient first noted that the upper part of the anterior aspect of the right thigh was swollen. The swelling persisted. It had never been tender or red, although he had noted some pain and weakness in the right knee and "aching" in the muscles of the right midthigh. There was no history of trauma to this area or of cough, chest pain, dyspnea or change in appetite or bowel habits. He stated that he had passed "red urine" on a few occasions the week before admission, there had been nocturia, one time, for many years but no frequency or dysuria.

Fourteen years previously he had had a period during which he felt "weak and rundown"; he had had all his teeth extracted and following this had regained his usual feeling of well being and had felt well since. There had been no other serious illnesses in the past. He had consumed considerable beer and whisky daily for many years.

Physical examination revealed a well developed man in no distress. The heart and lungs were negative. The liver and spleen were both palpable four fingerbreadths below the costal margin; both organs were firm and nontender. There was a nontender mass in the right lower quadrant that had a cystic feeling and extended up to at least the level of the umbilicus and a second nontender, tense cystic mass the size of a large grapefruit lying in the right upper anterior thigh, just below the inguinal ligament. Impulses from the mass in the thigh were transmitted through the femoral canal to the abdominal mass. Dilated veins were present over the mass in the upper thigh. There was no restriction of movements of the hip. The pulses were present and equal in both lower extremities.

The temperature was 99.2°F., the pulse 88 and the respirations 20. The blood pressure was 130 systolic, 80 diastolic.

The urine, of specific gravity 1.015, was normal. Examination of the blood showed a hemoglobin of 15 gm. and a white-cell count of 17,200, with 87 per cent neutrophils. The total protein was 7.35 gm. with an albumin-globulin ratio of 2.6, the nonprotein nitrogen 36 mg. and the bilirubin 0.5 mg. total per 100 cc.; the cephalin flocculation was ++ in 48 hours, the prothrombin time 14 seconds (normal, 14 seconds) and the bromsulfalein excretion normal. Examination of the sputum was negative for tubercle bacilli. Roentgenogram of the chest showed clear lung fields, a somewhat prominent left ventricle and a moderately tortuous aorta. Barium-enema examination revealed the entire colon to be readily filled, with all segments mobile; the barium did not enter the terminal ileum but did fill the appendix for a distance of 8 or 9 cm. The spleen was enlarged and displaced the splenic flexure medially. The cecum, appendix and ascending colon were displaced superomedially (Fig. 1); no definite mass could be made out. Overlying the upper central portion of the right ilium was a 0.5-cm. area of density. Intravenous pyelogram revealed the left kidney to be normal in shape and position and the right one to be low and rotated. Both kidneys showed prompt and adequate excretion. The right ureter was displaced medially almost to the midline. The bladder shadow was symmetrical. No bone destruction was seen.

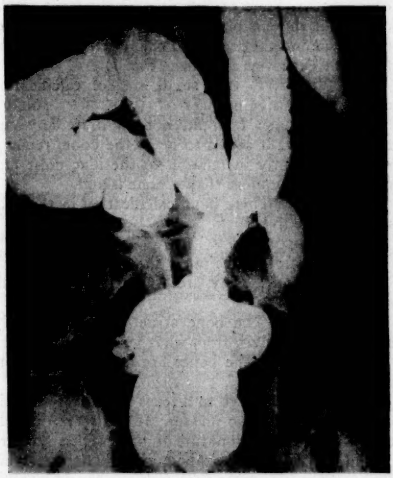

FIGURE 1.

On the eighth day an operation was performed.

Differential Diagnosis

Dr. Claude E. Welch*: In the first place, this man was an Albanian; that immediately brings up for discussion more exotic diseases than those we usually encounter here.

May I look at the x-ray films?

Dr. Joseph Hanelin: The examination of the chest shows clear lung fields and no evidence of increased pleural fluid. There is slight left-ventricular enlargement. The abdominal film shows an area of increased soft-tissue density in the right lower abdomen and an enlarged liver and spleen. From the pyelogram there is no evidence of intrinsic disease of the urinary tracts. However, the right kidney is depressed and rotated on its vertical axis and the ureter is displaced rather far medially. The left kidney is normal in all respects. The barium-enema examination shows no intrinsic involvement of the colon, but there is obvious upward displacement of the cecum and the ascending colon by the mass that fills the right lower abdomen (Fig. 1).

Dr. Welch: Is that small area of calcification there of much significance?

Dr. Hanelin: I would not attribute any significance to it; it seems to be in the bone, remains rather constantly in relation to the iliac crest and may be nothing more than a bone island.

Dr. Welch: There is no calcification in the substance of the liver?

Dr. Hanelin: No.

Dr. Welch: Are the psoas shadows normal?

Dr. Hanelin: They are well outlined on both sides.

Dr. Welch: The bone structure is apparently normal in the pelvis, from what you can see?

Dr. Hanelin: The bones are normal in appearance.

Dr. Welch: I have to discuss the nature of this mass, or perhaps two masses. It is always difficult to be sure of the exact nature of masses felt anywhere in the abdomen. You know the old story about masses in the neck — if there are seven observers, there are seven diagnoses. That is often true in other parts of the body. The mass, however, as it was described, was nontender and had a cystic feeling. That may mean the mass felt full of fluid or it may mean that it felt globular. I assume it was a somewhat globular mass that felt as if it were full of fluid rather than solid. There was a second nontender tense cystic mass lying just below the inguinal ligament. There does not seem to have been any evidence that the mass was associated with the great vessels of the legs or with the bone. As the mass was just below the Poupart ligament, one immediately thinks of a tuberculous abscess that had descended along the psoas muscles and showed up in the femoral triangle.

In the history was the story of red urine, but urine examinations were negative in the hospital; hence I cannot attach too much importance to it. The large liver and spleen could have been of significance, or they could have been a complete "red herring" in this particular patient. The patient was an Albanian and had had a high alcoholic intake.

I return again to the masses, which were associated with only a very slight fever and leukocytosis with an increased percentage of neutrophils. It must have been a retroperitoneal mass from the displacement of the ureter. Palpation of it suggested that it was full of fluid, so the chances of its having been a solid tumor are considerably reduced. The only solid tumors that could feel like that are a myxofibrosarcoma or possibly a liposarcoma, both of which would be very rare in this particular location and not likely to give the sensation felt by the examiner.

If it was not a tumor, it would have to have been some sort of inflammatory reaction, and the most likely lesion in this particular patient would be a psoas abscess or an echinococcus cyst. A psoas abscess is usually due to tuberculosis, but tuberculosis has been quite well ruled out by various tests; the sputum was negative for tubercle bacilli, and the chest and the spine were normal in the x-ray films; furthermore, the psoas shadow was well demonstrated. Occasionally a dissecting abscess runs down to that particular area from the pancreas. That is again very rare, usually appears on the left side and rarely goes down to the thigh.

If this was a manifestation of echinococcus disease, I could explain a number of the features. If there were two tense, cystic masses, one below the inguinal ligament and one in the lower abdomen, the echinococcus disease becomes even more possible. The nationality of the patient is of importance in that respect. The temperature and white-cell count could go perfectly well with that diagnosis if there was secondary infection in one of the cysts. The absence of eosinophilia is not against the diagnosis, as in this particular stage in the patient's life the cysts may have been inactive and the organisms dead. I have no information on whether any antigen tests were made or not, although they are frequently positive if echinococcus disease is present. However, since I have to make a diagnosis on the information that I am given, I shall call it echinococcus disease.

Dr. Robert E. Scully: We have the additional information that echinococcus skin tests were done on two occasions and were negative.

Dr. Welch: Negative tests do not exclude echinococcus disease. They are negative when the organisms have died and secondary infection has supervened.

*Associate visiting surgeon, Massachusetts General Hospital.

Clinical Diagnosis

Echinococcus cyst.

Dr. Welch's Diagnosis

Suppurating echinococcus cyst.

Anatomical Diagnosis

Echinococcus cyst, retroperitoneal, with extension to thigh.

Pathological Discussion

Dr. Scully: On the eighth hospital day, the mass below the inguinal ligament was aspirated and material described as "whitish pus containing many cheesy particles" was withdrawn. The cystic structure was then marsupialized both above and below the inguinal ligament. Four days later the cyst was excised. It was described by the surgeon as extending retroperitoneally from the lower pole of the right kidney, under the inguinal ligament, lateral to the femoral sheath, and through the adductor canal to about six inches below the inguinal ligament. We received from both operations numerous fragments of cyst wall. This ranged up to about 1 cm. in thickness and presented a yellowish, finely nodular inner surface.

Figure 2. *Photomicrograph of Echinococcus-Cyst Wall. In the center of the dense collagenous tissue is a fragment of wavy chitinous membrane surrounded by foreign-body giant cells.*

Microscopically, the cyst wall was composed of chronically inflamed dense collagenous tissue that showed a foreign-body reaction to the cyst contents. We were unable to find any scolices or germinal membranes, which characterize the active echinococcus cyst. In many of the foreign-body giant-cell granulomas, however, were fragments of wavy hyaline membrane, the so-called chitinous membrane (Fig. 2), which is a secretion product of the germinal layer of the echinococcus cyst. This cyst then appeared to be an inactive or sterile one, and this fact may account for the negative skin tests.

It was learned that up to the age of twenty-two the patient had lived in Albania on his father's farm, where sheep and cattle were raised, so he could very easily have been exposed to the disease.

CASE 38212

Presentation of Case

First admission. A seventy-six-year-old man entered the hospital because of chest pain.

The patient had noted mild shortness of breath on exertion for a month before admission. The afternoon prior to admission he suddenly developed a tight feeling across the midsternal region that was accompanied by palpitations and lasted about twenty minutes. There were two recurrences of this feeling, each lasting twenty minutes, one after the evening meal and the second early on the morning of admission. There was no radiation of this distress upwards or into the arm, and it was not accompanied by sweating or dizziness. There was no history of epigastric distress, orthopnea, ankle edema, past episodes of chest pain or urinary disturbance and no past illnesses of significance.

Physical examination revealed a well developed, well preserved man in no acute distress. The lungs were clear. The heart was not enlarged. There was a Grade I aortic systolic and a Grade II apical systolic murmur. The aortic second sound was louder than the pulmonic. The abdomen was negative. There was no peripheral edema.

The temperature was 98.3°F., the pulse 72 and the respirations 20. The blood pressure was 145 systolic, 80 diastolic.

Examination of the blood showed a hemoglobin of 15.5 gm. and a white-cell count of 6900; the sedimentation rate was normal. The nonprotein nitrogen was 32 mg. per 100 cc. A urine, of specific gravity 1.020, was normal. Roentgenogram of the chest demonstrated a normal-sized heart, a moderately tortuous aorta and emphysema of the lungs with linear strands of density in the right and left upper lobes. An electrocardiogram revealed a normal rhythm at rate of 65, a PR interval of 0.16 second, a QRS interval of 0.07 second and a normal axis; the T waves were upright in Leads 1, 2, AVF, AVL and V_1; low upright in Leads 3, V_4 and V_6;

diphasic in Leads V_2 and V_3; and inverted in Lead V_4. There was a normal progression of R and S waves in the precordial leads.

In the hospital the patient had an occasional attack of "choking with trouble breathing" but without pain, lasting about one-half hour; the last attack was promptly relieved by nitroglycerin. Repeated electrocardiograms showed no changes of diagnostic significance from the first one. He felt generally well and was discharged on the eleventh day.

Final admission (thirteen days later). In the interval he did fairly well on restricted activity. He had had no chest pain or shortness of breath. On the day of admission he experienced severe substernal pain accompanied by an uncomfortable sensation down the inner aspect of the left arm. The pain was choking and crampy in character, not related to exertion and not relieved by nitroglycerin; it gradually subsided at the end of an hour, although an uncomfortable sensation persisted in the chest for several hours.

Physical examination was unchanged from the previous admission.

The temperature was 98°F, the pulse 72 and the respirations 20. The blood pressure was 140 systolic, 80 diastolic.

Urinalysis was negative. Examination of the blood showed a hemoglobin of 13.8 gm. and a white-cell count of 7950, with a normal differential. The serum nonprotein nitrogen was 27 mg. per 100 cc. and the prothrombin time 14 seconds (normal, 14 seconds). In the electrocardiogram, compared with previous tracings, the T waves in the chest leads had become more deeply inverted; the T waves in Leads V_5, V_4 and V_6 were inverted at this time. Roentgenogram of the chest was unchanged; a Graham test demonstrated a normal gall bladder.

On the fifth day the patient experienced crushing chest pain extending to the back; it was the most severe pain that he had had and required Demerol for its control. It persisted for about twenty-four hours, shifting to the left precordium and being accompanied by pain in the left shoulder and neck. A white-cell count was 22,000 and an electrocardiogram showed upright T waves in Lead V_1 with elevated ST segments and deep late inversion of the remaining T waves in the chest leads with dramatic ST-segment elevation. Physical examination revealed a temperature of 100°F., blood pressure of 160 systolic, 86 diastolic and fair heart sounds; the aortic second sound was louder than the pulmonic and an apical pericardial friction rub extended inwards to the left sternal border. Anticoagulant therapy was begun and a satisfactory therapeutic level of prothrombin was maintained. He was free of chest pain until the tenth day; examination during this time showed a regular rhythm, no gallop or friction rub and clear lungs. On this day he had several episodes of right-chest and shoulder pain and one of diffuse chest and abdominal pain, all of which required Demerol for relief; the white-cell count was 11,400 and an electrocardiogram showed the elevation of the ST segments in Leads 2 and 3 to have become a little more marked and the slight late inversion of the T waves in Leads V_3 and V_4 to have disappeared. On the eleventh day examination showed the heart to be enlarged to the left, with the point of maximal impulse 2 cm. beyond the midclavicular line in the fifth intercostal space and a Grade III to IV systolic murmur, maximal at the lower left sternal border and well transmitted to the apex. The pulmonic second sound was louder than the aortic second sound but was not accentuated. There were a few rales at the bases of the lungs. Digitalis was begun. He continued to feel fairly well until the twentieth day, when he began to feel extremely weak; examination showed dyspnea on slight exertion, distended neck veins pulsating at a 30° angle, considerable moist rales at both lung bases, dullness and decreased breath sounds at the right base, tenderness in the right upper quadrant of the abdomen, heart findings unchanged, slight edema of the right foot, a temperature of 100.3°F and a white-cell count of 13,600. He was given ammonium chloride, Mercuhydrin and antibiotics. His temperature continued to be elevated up to 102°F. and he remained critically ill. Moist rales could be heard over most of the chest, and a diastolic gallop and a definite apical systolic thrill became evident.

He died on the twenty-fifth day.

Differential Diagnosis

Dr. James H. Currens*: This man's illness extended over a period of seven weeks from the time of onset until the time of his death. According to the symptomatology, I think it can be fairly well divided into four incidents; the first three, which were quite similar, I would interpret as varied manifestations of coronary heart disease with thrombosis and infarction. The onset of angina pectoris was quite sudden; he had pain on the first day after meals and again early in the morning. The suddenness of onset certainly suggests that the patient had an acute occlusion on that day or the preceding day, most likely due to thrombosis. The duration of the pain did not suggest infarction at that time. The electrocardiogram revealed slight T-wave abnormalities mainly in the precordial region close to the sternum; however, the abnormalities were those usually seen with minor injury, not with a good-sized infarction. Physical examination revealed a systolic murmur that, in this elderly man with an emphysematous chest, I would interpret as arising in the aortic valve or just beyond, possibly related to slight dilatation of the aorta or early stiffening of the aortic valve.

*Assistant physician, Massachusetts General Hospital.

May I see the x-ray films? It always disturbs me that the emphysematous nature of the chest is noted in the x-ray report rather than on physical examination.

DR. STANLEY M. WYMAN: The scarring in the upper lung fields is well seen; the upper lobes, in particular the right upper lobe, are considerably reduced in size. This is presumably an old process. However, one spot film of the region of the bifurcation of the major bronchi shows very poorly the upper-lobe orifice, and I cannot make any definitive statement about its integrity. The emphysema of the lungs is well demonstrated. The heart shadow is not greatly enlarged, but in view of the severe degree of emphysema it may be larger than it seems.

DR. PAUL D. WHITE: Do you base that diagnosis of emphysema on the increased depth of the chest?

DR. WYMAN: The interpretation of emphysema is based on the increased depth of the chest and the low position and rather flattened contour of the diaphragm. The aorta is tortuous, as described in the protocol, but not unduly so for a man of that age.

DR. CURRENS: Perhaps some stiffening of the aortic valve cusps might better explain that systolic murmur than dilatation of the aorta beyond.

DR. WHITE: I thought it was louder at the apex than in the aortic area.

DR. CURRENS: I would think that would still be compatible; in this age group with emphysema, aortic systolic murmurs are not infrequently heard better at the apex than in the aortic area.

DR. WHITE: Would not the character of the murmur be of some importance?

DR. CURRENS: The murmur is not described as being musical in character. Oftentimes aortic murmurs have a high frequency. It apparently was not a very loud murmur.

Before the patient left the hospital at the time of the first admission he had choking and dyspnea, suggesting angina decubitus. On the twenty-fourth day after the first episode, he had another attack of substernal pain that lasted an hour and certainly was suggestive of more than coronary insufficiency, although coronary insufficiency can occasionally last this long. There were progressive changes in the electrocardiogram that would lead one to suspect further injury; I would be inclined to believe he had myocardial infarction at that time, although there was no fever or leukocytosis to substantiate this.

The third episode occurred on the twenty-ninth day of the illness and on the fifth day after the second entry. At that time he had a pain lasting twenty-four hours and extending through to the back. There were leukocytosis, fever and further changes in the electrocardiogram — elevation of the ST segments, particularly in the precordium close to the sternum, which can result from myocardial infarction or from pericarditis. A friction rub was noted. To find that the pain went through to the back is disturbing. One might consider dissection of the aorta under these circumstances, but there was no appreciable hypertension, and the pain of myocardial infarction does occasionally extend through to the back. At that time it was evident that he had a sizable myocardial infarction, but he got along quite well.

On the thirty-fourth day the fourth important event happened — he had right-chest pain, shoulder pain and diffuse abdominal pain, which is difficult to explain. There may have been further infarction of the heart, of course. The right-chest pain suggested the involvement of the lung itself by embolization and pleuritis. It is possible for embolization of the lungs to occur with the rupture of an interventricular septum; I shall consider that later. The systolic murmur changed considerably at this time — it became quite loud, was loudest over the left lower sternum and was apparently well heard at the apex. This seemed to be an important occurrence; it was accompanied by an accentuation of the pulmonic second sound, indicating increased pulmonary arterial pressure, and was followed by signs of weakening of the heart muscle, cardiac insufficiency and congestive circulatory failure.

In the analysis of the final episode, which seems to be the important feature in this case, there are two or three possibilities. Rupture of a papillary muscle, which occurs occasionally as a result of posterior-wall myocardial infarction with appreciable mitral regurgitation, should be considered. The systolic murmur, the increase in the pulmonic second sound and the congestive failure are quite compatible with such a diagnosis. The fact that most of the electrocardiographic changes were in the precordial leads close to the sternum would suggest anterior myocardial infarction. The systolic murmur, best heard close to the sternum, would argue against mitral regurgitation. There was no evidence to suggest subacute bacterial endocarditis, which might rupture chordae tendineae rather than

a papillary muscle. Not too long ago, a case was presented here in which a systolic murmur of high frequency described as a musical murmur resulted from a mural thrombus in the left ventricle producing a certain amount of aortic stenosis.[1] A systolic murmur in the lower sternum might result from tricuspid regurgitation, which is something we do not consider quite as often as we should. Not only the location of the murmur but also the venous distention is quite consistent, but no deep jugular pulse was mentioned in the protocol. There is no reason to believe that there had been dilatation of the right side of the heart as in cor pulmonale — acute or chronic.

One is left with the diagnosis of rupture of the interventricular septum, which is always first considered when these murmurs appear after myocardial infarction. The points in favor of this are the localization of the murmur along the left of the sternum and the fact that the electrocardiogram indicated that most of the infarction involved the anterior portion of the heart. That the episode occurred about ten days after the patient had the third attack of pain is quite consistent with a rupture of the muscle, which usually occurs in the first two weeks. That would be consistent with a rupture of either the septum or the papillary muscle. The rapid decline in heart failure certainly indicated that something drastic happened. Against the diagnosis would be the fact that no involvement of the septum was noted in the electrocardiogram — one would expect to find impairment of the interventricular conduction, which was not present. If, however, the infarct were close to the apex, it might involve the septum without impairing the conduction. The apical systolic thrill is a little disturbing. I wonder if I might ask whether there was a comparable murmur in that area, and whether any mention is made of the distribution of this murmur, since that seems to be quite important.

Dr. Francis G. Barnum, Jr.: The murmur did not change in character; the thrill appeared the day before death.

Dr. Currens: There seems to be a slight disagreement concerning the thrill that was noted at the apex and the murmur that was described as being maximal over the lower left border of the sternum. Had there been a distinct change in the point of maximal intensity of the murmur, or was it thought to be about the same on both examinations?

Dr. Edwin O. Wheeler: As I recall, it was maximal between the sternum and the apex at all times.

Dr. Currens: We seem to be forever attempting to make the diagnosis of rupture of the interventricular septum but have not been very successful at these conferences in the past. It seems to me that the course of events in this patient and the physical findings are quite in keeping with this diagnosis. I prefer to think this was the most likely explanation for the systolic murmur and the rapid downhill course. I think the patient had recurrent multiple myocardial infarctions involving the apex and the lower portion of the septum, with rupture and the production of a septal defect.

Dr. Wheeler: When this murmur first appeared, it was maximal between the lower left sternal border and the apex; we were inclined at first to think it was more likely due to mitral insufficiency than to a ruptured septal defect, because there was no thrill associated with it and the patient's condition was fairly good. As he went downhill fairly rapidly and a thrill appeared, we thought very much as Dr. Currens did, that the murmur was due to a rupture of the septum or of a papillary muscle.

Dr. Barnum: About five days before death the patient spiked a temperature to 102°F. and rather suddenly went into congestive failure. We thought at that time of the possibility of pulmonary infarction, but the prothrombin time was maintained between 10 and 30 per cent and the legs were consistently negative; we also thought of pulmonary infection, but there was no response to antibiotics.

Dr. White: I am sure that all of us wondered how to explain the febrile episode. There were a number of colds going around at that time. I wondered whether a severe virus cold might have been enough to precipitate the congestive failure or whether the febrile episode otherwise was important in itself. The patient did not respond to therapy for the infection, although such might have been due to a virus that was not susceptible to such medication. There was also a question of infarction of the lung, but the legs always seemed to be all right. I agree entirely with what has been said about the murmur. I was on the fence as to its pathogenesis. There were three possible causes: rupture of the septum, rupture of a papillary muscle and mitral regurgitation associated with increasing dilatation of the heart terminally. However, mitral

murmurs generally decrease in intensity with increasing weakness of the heart, so I was in agreement with the idea of septal rupture.

One other point I should like to raise, which must remain in doubt, is whether, if we had given anticoagulants when he was having angina decubitus, the episode of myocardial infarction might have been avoided. Also, I would like to know Dr. Currens' thought about the possible responsibility of the anticoagulant for abetting a septal rupture. We do not have enough statistics yet, I suppose, to know whether patients on anticoagulants are more likely to have septal ruptures than those who are not.

DR. CURRENS: I myself am an "anticoagulationist." I do not think there is any convincing evidence that anticoagulants predispose to rupture. A recent study from this hospital failed to demonstrate any significant difference in the incidence of myocardial rupture in patients receiving Dicumarol as compared with those not receiving Dicumarol.[2]

CLINICAL DIAGNOSES

Congestive heart failure.
Myocardial infarction.
?Interventricular septal rupture.

DR. CURRENS' DIAGNOSES

Ruptured interventricular septum.
Myocardial infarctions.

ANATOMICAL DIAGNOSES

Myocardial infarction with rupture of interventricular septum.
Pericarditis, acute fibrinous.
Pulmonary edema and congestion.

PATHOLOGICAL DISCUSSION

DR. BENJAMIN CASTLEMAN: The pericardial cavity contained about 40 cc. of hemorrhagic fluid and the entire serosa of the pericardium was covered with a fibrinous exudate, especially over this distended very thin apex, which might be called a cardiac aneurysm. There was a hole in the septum. The myocardium on the right side of the heart was yellowish and obviously infarcted over this entire area; the left ventricle was almost entirely infarcted. Not only anterior wall and septum but part of the posterior wall was infarcted. The infarction was in all stages; a large part was quite acute, with necrosis of muscle fibers and well developed polymorphonuclear leukocytes; in other areas, there was beginning disintegration of polymorphonuclear leukocytes; and in still other areas, evidence of healing with connective-tissue proliferation and phagocytes filled with hemosiderin; thus the patient had been having infarctions off and on for several weeks.

DR. WHITE: The infarction might have explained the final fever.

DR. CASTLEMAN: I think it did. We have no evidence of any recent thrombosis in any of the coronary vessels. They all were very sclerotic and narrow, so maybe the anticoagulant did prevent thrombosis, although it did not prevent the very recent infarction.

DR. WHITE: Did the blood pressure drop?

DR. BARNUM: It was 110 systolic, 80 diastolic until the day before he died.

DR. WHITE: This is another case of infarction without thrombosis, just as one can have thrombosis without infarction.

DR. CASTLEMAN: There was no evidence of infarction in the lungs; the lesions at the apices were healed scars of tuberculosis. The lungs showed edema and congestion.

DR. WHEELER: Did he have a mural thrombus in the heart?

DR. CASTLEMAN: Yes; there was a large mural thrombus over most of the infarcted area.

DR. WHEELER: The anticoagulants, then, did not prevent the formation of a mural thrombus!

REFERENCES

1. Case Records of the Massachusetts General Hospital (Case 38062). *New Eng. J. Med.* 246:233-238, 1952.
2. Grant, K. B. Unpublished data.

The New England
Journal of Medicine

Formerly
The Boston Medical and Surgical Journal
Established 1828

Official Organ of
THE MASSACHUSETTS MEDICAL SOCIETY
and
THE NEW HAMPSHIRE MEDICAL SOCIETY
OWNED BY THE MASSACHUSETTS MEDICAL SOCIETY AND PUBLISHED WEEKLY UNDER THE JURISDICTION OF THE COMMITTEE ON PUBLICATIONS

Richard M. Smith, M.D., *Chairman*
James P. O'Hare, M.D. — Conrad Wesselhoeft, M.D.
Oliver Cope, M.D. — Richard E. Alt, M.D.

Joseph Garland, M.D., EDITOR

ASSOCIATE EDITORS
Thomas H. Lanman, M.D. — Donald Munro, M.D.
Theodore H. Ingalls, M.D.

Clara D. Davies, EXECUTIVE EDITOR
Robert O'Leary, ASSISTANT EDITOR*
James F. Ballard, BOOK REVIEW EDITOR

EDITORIAL BOARD
C. Guy Lane, M.D. — C. Stuart Welch, M.D.
Henry R. Viets, M.D. — Vernon P. Williams, M.D.
Robert M. Green, M.D. — Benjamin Castleman, M.D.
Dwight O'Hara, M.D. — Hugh R. Leavell, M.D.
Fletcher H. Colby, M.D. — J. Englebert Dunphy, M.D.
Robert L. Goodale, M.D. — Robert W. Buck, M.D.
Chester M. Jones, M.D. — Herrman L. Blumgart, M.D.
Harvey R. Morrison, M.D. — Frank N. Allan, M.D.
Maxwell Finland, M.D. — Harvey A. Kelly, M.D.
Deering G. Smith, M.D.†

*On leave of absence with the Armed Forces.
†Representing the New Hampshire Medical Society.

SUBSCRIPTION TERMS: $8.00 per year in advance, postage paid, for the United States (medical students and first-year interns, $5.00 per year); Canada, $9.00 per year (Boston funds); foreign, $10.50 per year.

MICROFILM volumes available to regular subscribers through University Microfilms, 313 N. First Street, Ann Arbor, Michigan.

MATERIAL, other than original articles, should be received not later than noon on Thursday, three weeks before date of publication.

THE JOURNAL does not hold itself responsible for statements made by any contributor.

COMMUNICATIONS should be addressed to the *New England Journal of Medicine*, 8 Fenway, Boston 15, Massachusetts. Telephone KE 6-2094.

RETROSPECT AND INTROSPECT

PENSIVE observers occasionally contemplate, with amazement or alarm, the swollen stream of periodical medical literature and raise the question to what purpose it exists; whence does it come and whither is it flowing? With the practical application of medical knowledge in need of constant adaptation to its own progress, into what parts of this current should the physician let down his bucket; what must he read, of the 7000 or 8000 medical journals in current publication, to hold his place in his profession? And the flood level still rises, despite the controlling influence of rising costs of publication and, more important, increasing competition for the doctor's available reading time.

Much of this inky tide is composed of the specialty journals — that exuberant, burgeoning group, of which, as Barnum might have said in serious exaggeration, one is born each minute. They serve their purpose for those joyous aristocrats of medical society for whom they are intended. In a different, perhaps more stable class, are the journals dedicated to the basic medical sciences and the larger divisions of medical practice. The house organs of local or sectional societies, if the term is taken without opprobrium, serve their geographical interests; the trade journals continue in the picture because of their financial resources and automatic distribution — and the few truly all-purpose journals make up the rest.

For the occasional all-purpose journal of wide distribution that serves also as a medical-society organ, some compromise must be effected in its dual functioning. Its editors, nearly as intrepid as Odysseus, must steer a course in their selection of material between the granite-faced Scylla of purely utilitarian dogma and the Charybdian vortex of the swiftly developing results of ultrascientific research. Their destruction is not necessarily involved if they fail sometimes to steer the middle course, but their duty is nevertheless to try to provide material of which each reader will find some part to his taste. It is a foregone conclusion that with a mixed reader group of diverse interests all tastes cannot be completely satisfied all the time. The menu must be *à la carte*, not *table d'hôte*. The critical reader will presumably look over the entire bill of fare and make his choice, not bellow at each meal for ham and eggs or nothing. Those who are pleased with nothing that is offered will not, it is assumed, be included among such a journal's readers.

The general practitioner, as representing the largest single group in the profession, deserves to be accepted as the intelligent and educated person that he usually is, thoroughly imbued with a holistic concept of man and his diseases and requiring as much as anyone to have good medical literature presented for his sampling. This intelligent practitioner does not want only to be spoon fed a predigested diet. He wants also to view medicine in its broadest aspects and to make his independent way as a specially educated member of a learned

profession, not to become simply a highly trained technician in the routine treatment of statistically prominent diseases.

To paraphrase without its wit a familiar witticism, he must not allow himself to become more and more obsessively familiar with a variety of common complaints until finally he comes to know little or nothing outside the serried facts required for the winning of his daily bread. It is the duty of the journal that would best serve his needs to lead him beyond the obviously practical and the immediately applicable into those fields of original endeavor where he may be refreshed by that which has been newly discovered, and stimulated by the prospect of knowledge yet to come.

THE MODERN TYPHOID

As THE human community strives to develop means of mutual living and to organize its resources for the benefit of its individual members, nature utilizes such new implements to promote spread of the smallest members of the community, the pathogenic agents. For centuries and millennia, man has had to cope with typhoid fever, with which nature taxed his efforts at organized living. Common water and food supplies were ideal vehicles for the typhoid bacillus. Typhoid became the crowd disease of cities, with only sporadic outbreaks in rural homes and villages.

Typhoid is now past history in modern civilization. Its conquest during half a century was brief in comparison to its long association with man. The first and efficient attack was developed from knowledge of the mode of transmission, but the lasting victory was won by meticulous search for the reservoir of human carriers of the disease. Sanitary engineering and epidemiologic intelligence share the honors of the battle of typhoid.

Human ingenuity develops at a steadily increasing rate, but nature seems able to keep in step. The last decade has seen a new disease arise as a consequence of man's constructive progress. Homologous serum jaundice came with progress in methods of blood transfusion, and with organized collection and pooling of human blood. After its major dramatic epidemic in the American invasion forces in North Africa, the disease settled down to become a common threat to our hospitalized population. Although less fatal than typhoid, it is a serious disease that is constantly lurking behind the glittering triumphs of modern medicine.

Man, in the combat of serum jaundice, is at the stage where he was when chlorination, boiling of water and personal hygiene were the only means of suppressing typhoid. There is good evidence that irradiation is an effective means of sterilizing icterogenic plasma pools, but it is only one weapon against a widespread disease, and the facilities of bacteriologic diagnosis that guided the control of typhoid at the turn of the century are lacking.

Dr. Joseph Stokes, Jr., of Philadelphia, in a recent lecture at Harvard Medical School gave some evidence from his extensive experience with serum jaundice that may lead to a second stage in the attack on "the modern typhoid." He and others have shown the existence of permanent healthy carriers of the virus whose identification is still a cumbersome procedure. The not too distant future, however, may give the means of direct focal attack on the reservoir of disease by excluding these carriers from the large pools of human blood that flow from Red Cross donations through the processing laboratories to civilian and military patients. Another intriguing part of Dr. Stokes' account was a report of transmission of serum-jaundice virus from a healthy mother to her child, delivered by cesarean section. If placental transfer of the virus is nature's original mode of transmission and life-long healthy carriers exist, new light is thrown on the mysterious epidemiology of serum jaundice. The widespread existence of the virus cannot be explained by modern parenteral therapy alone. Perhaps the disease has been with mankind as long as typhoid, silently and unobserved, transmitted from mother to child.

ADOPTION IN MASSACHUSETTS

THE General Court of Massachusetts, in 1950, passed new laws relative to the adoption and the protection of children. Although, like most laws, not perfect, they are nevertheless the result of a careful and conscientious study made by a special commission of the Legislature and already have as their result greatly improved conditions, not only

in the welfare and protection of the adopted child but also in the protection of adopting parents.

The most important point of this legislation is that placement of a child in adoption is now restricted. Massachusetts law regulates placing a child for adoption and provides penalties for "any person other than a duly authorized agency" (of certain specified types of social agencies) "who in any way offers to dispose of any child or holds himself out as being able to dispose of children in any manner." It is further specifically provided that in making orders for adoption "the judge, when practicable must give custody only to persons of the same religious faith as that of the child."

In view of the adoption law, the directors of the United Community Services of Greater Boston at a meeting held in September, 1950, approved the recommendation of the Greater Boston Community Survey that the Boston Children's Friend Society become the primary nonsectarian adoption agency of the community. A better choice could hardly have been made, for the Society, founded in 1833, has been caring for neglected and orphaned children since its establishment.

In the year and a half since the present laws went into effect, private adoption services have tended to disappear, and the "bootlegging" of infants is becoming a thing of the past. Adoptions sponsored by state-approved children's agencies are increasing, and those initiated by private physicians are rapidly dropping out of the picture.

This is as it should be. For the protection of all parties, regular agency channels, with their facilities for investigation, should be employed, and the physician should gladly relinquish the role of *deus ex machina*, whether he had assumed it as an occasional service to a patient in need or for personal profit.

PRIZE-ESSAY AWARDS

THE editors of the *Journal* again take pleasure in announcing the results of the annual prize-essay competition for fourth-year medical students. The first prize of this fourth annual contest, amounting to $100, has been awarded to Robert B. Mellins of Johns Hopkins University School of Medicine. Mr. Mellins' "Report of a Case of Acquired Fistula between the Esophagus and the Respiratory Tract," with a review of the literature and a discussion of the pathogenesis of the condition, will be published in a subsequent issue of the *Journal*.

The second prize was awarded to an essay produced jointly by George Ehrlich and Melvin Levinson, senior students at the Chicago Medical School, who presented a case of "mycosis fungoides." Each will receive a year's free subscription to the *Journal*.

The report of a case that the student has personally studied, with a discussion and review of the subject, seems to the editors to provide a useful subject for students to discuss, in line with the academic work in which they are engaged. The same broad subject will be assigned for 1953, with the hope that still more schools will be represented by the students who may enter the competition. Manuscripts are to be in the hands of the editor by March 15, 1953.

It may occasionally be necessary to repeat that in the judging of this competition literary merit will be considered as well as the treatment of the material. Persons who are as prolific in writing as are the members of the medical profession should reasonably be expected to show a comparable acquaintance with literary style.

Yellow fever rages most destructively at Rio Janeiro. Say what they may to the contrary, the entire experience of that country proves that it is an infectious disease of uncommon energy, which medicine does not control.

Boston M. & S. J., *May 26, 1852*

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

LICENSING OF BLOOD BANKS REQUIRED BY NEW BLOOD-TRANSFUSION REGULATIONS

The Massachusetts Public Health Council, at its session held March 11, approved a revised set of "Rules and Regulations Relative to the Use of Blood or Other Tissues for Purposes of Transfusion." A public hearing on the draft of these rules and regulations was held on February 19, after advertisement in newspapers as required by the provisions of General Laws, Chapter 30, Section 37A, as inserted by Chapter 576 of the Acts of 1951. In further compliance with the above Act the subject rules and regulations were filed with the Secretary of State of Massachusetts on March 14.

The new regulations, according to law, take effect at once; mimeographed copies are being distributed to all hospitals in the Commonwealth prior to printing the regulations in the Manual of Laws Relating to Public Health.

There have been changes and additions to the old regulations, chief among which is a requirement that hospitals apply to the Department of Public Health for authority to operate a blood bank, approval to be granted only after inspection by the Division of Hospitals.

Application should be made at once to the Division of Hospitals for license for blood banks, after which the bank may continue in operation until inspected.

Other changes apply to examination of donors. Infectious hepatitis now disqualifies them for one year instead of permanently; age requirements have now been relaxed to permit persons over sixty years of age to donate blood with the written consent of a physician; and minors under twenty-one who are married or in the armed services no longer need the consent of parent or guardian.

As regards the collection of blood, there are added safeguards concerning the bleeding room, supervision of bleedings, donor identification and proper sterilization of lancets and needles, all designed for further protection of donors.

Very little change has been made in the manner of storage and handling. Grouping and typing have been modified to set standards for the serums used.

Identification and labeling requirements have been changed to unify the system among different hospitals.

The Department wishes to express its appreciation to the Massachusetts Medical Society, the Association of Blood Bank Directors and the other organizations and individuals who generously aided during the past several months in revising these regulations.

TETANUS ANTITOXIN

The Biologic Laboratories have been working for several months to prepare tetanus antitoxin by methods that include pepsin digest modification. Sufficient quantities have been prepared so that distribution may now be made through local boards of health. The 1500-unit prophylactic dose is the only size available. This antitoxin has undergone extensive testing in animals as well as clinical trials in comparison with a similar commercial product. Although these tests have shown that serum reactions following its use are much reduced, both in number and severity, as compared with reactions to antitoxin not treated by pepsin, it is nevertheless important always to determine the patient's sensitivity before use. Although the pepsin-treated antitoxin is deprived of most of the horse-protein reactivity, it is not advisable to use this product without a previous sensitivity test. For this test it is preferable to use the horse-serum sensitivity tests distributed by the Department. This sensitivity-testing material is diluted and prevents the possibility of a severe reaction to a preliminary injection of a small amount of antitoxin.

JAMES W. MCCOMB, D.V.M.

BOOKS RECEIVED

The receipt of the following books is acknowledged, and this listing must be regarded as a sufficient return for the courtesy of the sender. Books that appear to be of particular interest will be reviewed as space permits. Additional information in regard to all listed books will be gladly furnished on request.

The Essentials of Modern Surgery. Edited by R. M. Handfield-Jones, M.C., M.S., F.R.C.S., senior surgeon to St. Mary's Hospital, lecturer in surgery, St. Mary's Hospital Medical School, member of the Court of Examiners, R.C.S., and examiner in surgery to the University of London; and Sir Arthur E. Porritt, K.C.M.G., C.B.E., M.A., M.Ch., F.R.C.S., surgeon to His Majesty the King, surgeon, St. Mary's and Royal Masonic Hospitals, consulting surgeon, Acton, North Herts and South Beds, Teddington, Hampton Wick and District and Paddington (L.C.C.) Hospitals, and examiner in surgery, University of Cambridge. Fourth edition. 8°, cloth, 1263 pp., with 644 illustrations. Baltimore: The Williams and Wilkins Company, 1951. $11.00.

This standard textbook of surgery, first published in 1938, has been revised and brought up to date. It is the composite work of 15 English surgeons and covers the entire field of surgery, both general and special. The printing was done in Great Britain. There is a good index. The publishing is excellent. The book reflects the current point of view of English surgery and should be in all collections on surgery.

Global Epidemiology: A geography of disease and sanitation. Volume II: *Africa and the adjacent islands.* By James S. Simmons, M.D., Ph.D., Dr.P.H., Sc.D. (Hon.), dean and professor of public health, Harvard University School of Public Health; Tom F. Whayne, M.D., M.P.H., Dr.P.H., Colonel (MC), United States Army, and chief, Preventive Medicine Division, Office of the Surgeon General, United States Army; Gaylord W. Anderson, M.D., Dr.P.H., Mayo Professor and director, School of Public Health, University of Minnesota; and Harold M. Horack, M.D., member of staff, Department of Medicine and Section of Cardiology, Ochsner Clinic, New Orleans, and instructor in medicine, Tulane University School of Medicine. Associate author, Ruth A. Thomas, M.A., M.P.H., research associate, School of Public Health, University of Minnesota, and instructor, Department of Tropical Public Health, Harvard University School of Public Health, and collaborators. 4°, cloth, 652 pp., with illustrations. Philadelphia: J. B. Lippincott Company, 1951. $15.00.

The first volume of this series, published seven years ago, covered India, the Far East and the Pacific area. This volume provides a concise summary of current health conditions in Africa. Lists of references are appended to the various chapters, and there is a comprehensive index. The publishing is excellent, and the set should be in all medical- and public-health libraries.

NOTICES

LECTURE BY PROFESSOR HILL

The Department of Preventive Medicine, Harvard Medical School, and the Harvard School of Public Health are sponsoring a lecture by A. Bradford Hill, D.Sc., Ph.D., professor of medical statistics at the London School of Hygiene and Tropical Medicine, on May 28 at 4:30 p.m. in the Auditorium of the Jimmy Fund Building of the Children's Hospital. Professor Hill will speak on "The Clinical Trial." Physicians, medical students and workers in medicine and mathematics are invited to attend.

THE SPRINGFIELD HOSPITAL

The educational program of the Springfield Hospital for the month of June is as follows:

Tuesday, June 3
12 m. Radiology Conference. Radiology Department.
Saturday, June 7
10–11 a.m. Surgical Grand Rounds.
11 a.m.–12 m. Medical-Surgical Clinic. Staff Conference Room.
Tuesday, June 10
12 m. Radiology Conference. Staff Conference Room.
Thursday, June 12
12-15 p.m. Staff Meeting. Staff Room.
Saturday, June 14
10–11 a.m. Surgical Grand Rounds.
11 a.m.–12 m. Clinicopathological Conference. Staff Conference Room.
Tuesday, June 17
12 m. Radiology Conference. Radiology Department.
Saturday, June 21
10–11 a.m. Surgical Grand Rounds.
11 a.m.–12 m. Medical Death Review. Staff Conference Room.
Tuesday, June 24
12 m. Radiology Conference. Radiology Department.
Saturday, June 28
10–11 a.m. Surgical Grand Rounds.
11 a.m.–12 m. Surgical Death Review. Staff Conference Room.

NEW ENGLAND HOSPITAL

The New England Hospital will present the following applied basic science lectures, sponsored by the Education Committee, at 8 p.m., in the lecture room of the Nurses' Home:

May 26. Treatment of Leukemia and Malignant Lymphomas. Dr. Stuart Finch.
June 2. Abnormal Bleeding. Dr. Janet McArthur.
June 9. Metabolism in Surgery. Dr. Francis Moore.
June 16. The Present Status of the Adrenal Gland. Dr. Rosemary Murphy.

All physicians are cordially invited to attend.

SOCIETY MEETINGS AND CONFERENCES

MAY 22–24. American Academy of Pediatrics. Page 522, issue of March 27.

MAY 23. The New England Rheumatism Society. Page 760, issue of May 8.

MAY 23. The New England Veterans Administration Surgical Society. Page 760, issue of May 8.

MAY 24–31. Springfield Hospital. Page 635, issue of April 17.

MAY 24. Annual Meeting. Massachusetts Association of Medical Technologists, Inc. Page 800, issue of May 15.

MAY 26–JUNE 16. New England Hospital. Applied Basic Science Lectures. Notice above.

MAY 26–28. Minnesota State Medical Association. Annual Meeting. Page 316, issue of February 21.

MAY 26–29. National Tuberculosis Association. Sheraton-Plaza and Statler hotels, Boston.

MAY 28. Lecture by Professor Hill. Page 837.

MAY 29–31. American Academy of Dental Medicine. Page 476, issue of March 20.

JUNE 3–28. Springfield Hospital. Notice above.

JUNE 5. Boston City Hospital House Officers' Association. Page 760, issue of May 8.

JUNE 5. New York Society for Circulatory Diseases. Page 676, issue of April 24.

JUNE 5–8. American College of Chest Physicians. Page 280, issue of February 14.

JUNE 6 AND 7. American College of Cardiology. Page 760, issue of May 8.

JUNE 6–8. International Academy of Proctology. Page 800, issue of May 15.

JUNE 7 AND 8. Society for Investigative Dermatology, Inc. Page 676, issue of April 24.

JUNE 18–20. Massachusetts Public Health Conference. Amherst.

JUNE 18–20. New England Health Institute. Page 760, issue of May 8.

JUNE 19–21. American Association of Genito-Urinary Surgeons. Page 434, issue of March 13.

JUNE 22–26. American Society of Medical Technologists. Twentieth Annual Convention. Portland, Oregon.

JUNE 23–25. Military-Civilian Medical Symposium. Murphy Army Hospital, Waltham.

JULY. Commonwealth and Empire Health and Tuberculosis Conference. Page 792, issue of November 15.

JULY 7–11. International Congress of Dietetics. Page 434, issue of March 13.

JULY 7–12. International Diabetes Federation. Page 316, issue of February 21.

JULY 8–11. Thirteenth British Congress of Obstetrics and Gynecology. Page 916, issue of December 6.

JULY 14–18. Tuberculosis Symposium. Page 800, issue of May 15.

JULY 14–19. International Congress of Physical Medicine. Page 998, issue of June 28.

JULY 24–26. Conference on Aging. Page 559, issue of April 3.

AUGUST 25–29. American Congress of Physical Medicine. Page 476, issue of March 20.

AUGUST 31–SEPTEMBER 6. Interamerican Congress of Cardiology. Page 422, issue of March 27.

SEPTEMBER 7–9. Combined session of the New Hampshire and Vermont State Medical Societies. Mount Washington Hotel, Bretton Woods, New Hampshire.

OCTOBER 28–30. New England Postgraduate Assembly. Hotel Statler, Boston.

OCTOBER 29. New England Obstetrical and Gynecological Society. Annual Meeting. Hotel Somerset, Boston.

NOVEMBER 3–7 AND 10–21. Courses in Laboratory Diagnosis of Tuberculosis. Page 354, issue of February 28.

JULY, 1953. International Congress on Medical Librarianship. Page 316, issue of February 21.

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING THURSDAY, MAY 29

THURSDAY, MAY 29
8:30–10 00 a.m. Fracture Conference. Boston City Hospital.
*9:00–10.00 a.m. Grand Rounds. Robert Breck Brigham Hospital.
12:00 m.–1:00 p.m. Weekly guest speaker. Dr. Bernard Lown. Current Concepts of Digitalis Therapy. Stearns Auditorium, New England Center Hospital.
4:00 p.m. Department of Bacteriology and Immunology. Dr. Ruth C. Burke. Coccidioidomycosis. Amphitheatre D, Harvard Medical School.
*4:00–5:00 p.m. Medical Division Lecture. Mount Auburn Hospital, Cambridge.

SATURDAY, MAY 31
10:30 a.m.–12:00 m. Electrocardiogram Interpretation. Massachusetts General Hospital.
*11:00 a.m.–12:00 m. Blood Clinic. Dr. William Dameshek. Stearns Auditorium, New England Center Hospital.

MONDAY, JUNE 2
8:30–9:30 a.m. Surgical Clinic by Entire Staff. Cheever Amphitheatre, Dowling Building, Boston City Hospital.
9:30–10:30 a.m. Hypertension Conference. Massachusetts General Hospital.
*11:30 a.m.–12:15 p.m. Clinical Conference. South End Health Unit, 57 East Concord Street. Dr. Cleaveland Floyd in charge.
12:00 m. Clinicopathological Conference (Boston Floating Hospital). Pratt Lecture Hall, Joseph H. Pratt Diagnostic Hospital.
12:00–1:00 p.m. Hematology Conference. Dr. Dameshek. Stearns Auditorium, New England Center Hospital.
*12:15–1:15 p.m. Clinicopathological Conference. Main Amphitheatre, Peter Bent Brigham Hospital.
*3:00–4:00 p.m. Gynecology Rounds. Mount Auburn Hospital, Cambridge.
*7:00–9:00 p.m. Anesthesia Teaching Conference. Stearns Auditorium, New England Center Hospital.
8:00 p.m. Abnormal Bleeding. Dr. Janet McArthur. Nurses' Home, New England Hospital.

TUESDAY, JUNE 3
*12:00 m.–1:00 p.m. Pediatric Rounds. Burnham Memorial Hospital for Children, Massachusetts General Hospital.
*12:15–1:15 p.m. Clinicoroentgenological Conference. Peter Bent Brigham Hospital.
*2:00–3:00 p.m. Pathological Conference. Mount Auburn Hospital, Cambridge.
*5:00–6:00 p.m. Surgical Lecture. Mount Auburn Hospital, Cambridge.

WEDNESDAY, JUNE 4
8:30 a.m. Eye Clinical Conference. Out Patient Department. Massachusetts Eye and Ear Infirmary.
*11:00 a.m.–12:00 m. Medical Clinic (Children's Medical Center). Amphitheatre, Children's Hospital.
*12:00 m. Boston State Hospital Psychiatric Seminar. Reception Building Auditorium, 591 Morton Street, Dorchester.
*12:00 m.–1:00 p.m. Clinicopathological Conference (Children's Medical Center). Amphitheatre, Peter Bent Brigham Hospital.
*12:00 m.–1:00 p.m. Clinicopathological Conference. Mount Auburn Hospital, Cambridge.
12:30 p.m. Weekly Pathological Meeting. Joslin Amphitheatre, New England Deaconess Hospital.
*2:00–3:00 p.m. Combined Clinic of All Services (Children's Medical Center). Amphitheatre, Children's Hospital.
4:00–5:00 p.m. Orthopedic Conference. Isolation Amphitheatre, Children's Medical Center.

*Open to the medical profession.